The workes of that famous chirurgion Ambrose Parey ... / Translated out of Latine and compared with the French by Tho. Johnson [and in part by G. Baker] Whereunto are added three tractates out of Adrianus Spigelius of the veines, arteries, and nerves. With large figures. ; Also a table of the bookes and chapters.

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PARÉ

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WORKES

1649

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THE WORKES of that famous Chirurgion Ambrose Parey

Translated out of Latine and compared with the French.

by Tho: Johnson.

Whereunto are added three Tractates out of Adrianus Spigelius *of the* Veines, Arteries, & Nerves, *with large* Figures.

Also a Table of the Bookes and Chapters.

London.
Printed by Richard Cotes, *and* Willi: Du-gard, *and are to be sold by* John Clarke, *entring into Mercers Chappell.* 1649.

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TO
THE RIGHT
HONOVRABLE
EDVVARD LORD HERBERT OF
Cherbury and *Caſtle Iſland*, and one
of his Majeſties moſt Honorable
Counſell of War.

My Lord,

IT is not the far-fetcht pedegree of noble Anceſtors, nor thoſe Honours your Lordſhip deſervedly poſſeſſes, that make mee crave your Patronage to this my Labour; but it is that Heroick mind, enriched with the choice endowments of Nature and Art, and that earneſt affection wherewith your Honour entertains all Sciences, Arts, and Artiſts, with that exquiſite Iudgment which ſees into the inner man, which embolden and incite me to ſue for your Honors aſſiſtance, in protecting the fame of him, who by your many favours is made yours. I know the ſeeming and ſelf-pleaſing Wiſdom of our times, conſiſts much in cavilling and unjuſtly carping at all things that ſee light, and that there are many who earneſtly hunt after the publike fame of Learning and Judgment, by this eaſily trod, and deſpicable path, which notwithſtanding they tread with as much confidence as folly; for that oft-times which they vainly and unjuſtly brand with opprobrie, outlives their *F*ate, and flouriſhes when it is forgot that ever any ſuch as they had being.

I know your Lordſhips diſpoſition to be far diſſenting from theſe men, and that you rather endeavour to build up the fame of your Learning and Judgement upon a ſtrong laid foundation of your own, than *Heroſtratus* like, by pulling down any howſoever fair built fabrick of another. I heartily wiſh that your Honour

could propagate this good, and that all Detractors might be turned into Actors, and then I know it would much mitigate their rigour in censuring others, when as they themselves were also exposed unto the same Hazzard.

I think it impertinent to acquaint your Honour with the Nature of the Work, my Pains in translating, or the Benefit that may ensue thereon, for that I know your Honour ignorant of nothing in this kind; neither doubt I of your favourable acceptance of the good will of him, that thinks himself much honoured by being

Yours,

THOMAS JOHNSON.

TO

To the Reader.

I Have here for the publike good taken pains to subject my self to common censure, the which I doubt not but to find as various as the faces of the Censurers; but I expect no thanks, nor hunt after other praise, than that I have laboured for my Countries good, if that deserve any. I fear not Calumniation (though sure to hear of it) and therefore I will not Apologize, but inform thee of some things concerning the Author his work, and the reason that induced me to the translation thereof, with some few things besides. For the Author, who was principall Surgeon to two or three Kings of *France*, he was a man well versed in the writings of the Antient and modern Physitians, and Surgeons, as you may evidently find by sundry places alledged in his works. For his experience, or practise (the chief help to attain the highest perfection in this Art) it was wonderfull great, as you may collect by his voyages recorded in the last part of this work; as also by that which *James Guilleman*, Surgeon to the *French* King, a man both learned and judicious in his profession, avers, speaking of his own education and progresse in the Art of Surgery. I so laid (* saith he) the first foundation of this Art in the Hospitall of *Paris*, being as it were, an ample Theater of wounds and diseases of all kindes, that for two whole years, during which time I was there conversant, nothing was consulted of, nothing performed, the Physitians, and Surgeons being present, whereof I was not an Auditor or Actor. There flourished at these times, and yet doth, *Ambrose Parey*, principall Surgeon to the most Christian King, the Author of this great work, most renowned for the most gracious favour of Kings, Princes and Nobles towards him, for his Authority amongst his equals, for his Chirurgicall operations amongst all men. Therefore I earnestly endeavoured to be received into his family, as unto another *Machaon*, or *Podalirius*: once admitted, I so by all dutifulnesse and due respect acquired his favour, that he, unlesse I were present and assisting, did nothing (such is his naturall gentlenesse and curtesie to all such as are studious of the Art) at home or abroad, in the field, in the tents, or lastly in this famous City of *Paris*, about the bodies of Dukes, Noblemen, or Citizens, in whose cure, he by the ardent desire of them all, had still the prime place.

* In his Epistle prefixed before the Latin edition of this Author.

Now for this work, hear what this same man in the same place affirmeth further: I not content with these means, which may seem sufficient, and too much, as desirous to satisfie my long thirst, determined to try whether I could draw, or borrow any thing from strangers, which our men wanted, to the fuller knowledge of Surgery. To this purpose I travailed over *Germany*, and then for four years space I followed the *Spanish* Army in the Low-countries; whereas I did not only carefully cure the wounded Souldier, but also heedfully and curiously observe what way of curing the renowned *Italian*, *Germane*, and *Spanish* Surgeons observed, who together with me were imployed in the Hospitall, for the healing of the wounded and sick. I observed them all to take no other course than that which is here delivered by *Parey*. Such as did not understand *French*, got some pieces of this work for large rewards, turned into Latin, or such Languages as they understood, which they kept charily, and made great store of; and they esteemed, and admired, and embraced this work alone, above all other works of Surgery, &c. Our Author also himself, not out of a vain-glorious ostentation, but a mind conscious of the truth of his assertion, affirms thus much of this his work. I have (saith he) so certainly toucht the mark whereat I aimed, that Antiquity may seem to have nothing wherein it may exceed us, besides the glory of invention, nor posterity any thing left, but a certain small hope to add some things, as it is easie to add to former inventions. Thus much concerning our Author, and the excellency of his work.

Now come I to my translation, the which, as desiring more a publike good, than private praise, I have performed plainly and honestly, labouring to fit it to the capacity of the meanest Artist; for these are they to whom I chiefly commend this work, and from whom I expect acceptation. I being by the earnest perswasions of some of this profession, chiefly, and almost wholly perswaded and incited to take this pains, who knowing the disability of understanding this Author in Latin or *French*, in many of the weaker members of the large body of their profession, dispersed over this Kingdome, and the rest of his Majesties Dominions, whose good, and encrease in knowledge may be wisht, that so they may be the better inabled to do good to such as shall implore their aid in their profession.

There

There are ſome (I know) will blame me for Engliſhing this work, as laying open the myſteries of a worthy Art, to the unworthy view of the vulgar. To ſuch I could anſwer as * *Ariſtotle* did to *Alexander*: but for the preſent I will give them theſe, which I think may ſatisfie any but the purpoſely malicious: the firſt is drawn from the goodneſſe of the thing, as intended for thoſe that want ſuch guides to direct them in their Art; for it is commonly granted, that, *Bonum quo communius eo melius.* Secondly, it hath been the cuſtome of moſt Writers in all Ages and Countries thus to do: *Hippocrates*, *Galen*, and the other Greeks, writ in their mother tongue the myſteries of their Art: thus did *Celſus*, *Serenus*, and others in Latin: *Meſue*, *Avicen*, *Serapio*, and others, in Arabick; as alſo, to go no further, our Author writ this work in his native *French*, and learned men have done the like in this, and all other Arts. And it is a great hinderance to us in theſe dayes, that we muſt be forced to learn to underſtand two or three tongues, before we can learn any ſcience, whereas the Ancients learned and taught theirs in their mother tongue: ſo that they ſpent a great deal leſſe time about words, and more upon the ſtudy of that Art or Science they intended to learn and follow. Thirdly, I muſt tell you, that, *Ex libris nemo evaſit Artifex*, No man becomes a workman by book: ſo that unleſſe they have had ſome inſight in the Art, and be in ſome ſort acquainted both with the tearms of Art; as alſo with the knowledge and uſe of the inſtruments thereto belonging, if by reading this, or any other book of the like naaure they becomes Surgeons, I muſt needs liken them (as *Galen* doth another ſort of men *) to Pilots by book only: to whoſe care, I think none of us would commit his ſafety at Sea, nor any if wiſe, will commit themſelves to theſe at land, or Sea either, unleſſe wholly deſtitute of other.

Vide Aul. Gel. l. 20 c. 4.

Gal. de ſimp. l. 6. Τὸς ἐν βιβλίοις Κυβερνήτας.

The other things whereof I muſt alſo give you notice, are theſe. The figures in the Anatomy are not the ſame uſed by my Author (whoſe were according to thoſe of *Veſalius*) but according to thoſe of *Bauline*, which were uſed in the work of Dr. *Crook*; and theſe indeed are the better and more compleat. Alſo pag. 528. I thought it better to give the true figure of the Helmet floured Aconite, mentioned out of *Pliny*, than to reſerve the faigned picture of *Matthiolus*, which in our Author was encreaſed with the further fiction of a Helmet. I have in ſome few places in the margent, which you ſhall find marked with a ſtar, put ſhort annotations, for the better illuſtration of that which is obſcure, &c. I have alſo in the Text to the ſame purpoſe, here and there put two or three words, contained in theſe limits [ ], which I find here and there turned into a plain Parenthesis, eſpecially toward the latter end of the book, but the matter is not great. Further I muſt acquaint you that the Apologie and Voiages, being the laſt part of this work, and not in the Latin, but *French* edicions, were tranſlated into *Engliſh* out of *French* by *George Baker*, a Surgeon of this City, ſince that time, as I hear, dead beyond the Seas.

This is all, Courteous Reader, that I have thought neceſſary to acquaint thee withall concerning this, which I would deſire thee to take with the ſame mind that it is preſented to thee, by him that wiſheth thee all happineſſe.

THOMAS JOHNSON.

THE AUTHORS EPISTLE DEDICATORIE

To Henry the third, the most Christian King of *France* and *Poland*.

EVen as (most Christian King) we see the members of mans body by a friendly consent are alwayes busied, and stand ready to perform those functions for which they are appointed by nature, for the preservation of the whole, of which they are parts; so it is convenient that we, which are, as it were, Citizens of this earthly Common-weal should be diligent in the following of that calling which (by Gods appointment) we have once taken upon us: and content with our present estate, not carried away with rashnesse and envy, desire different and divers things whereof we have no knowledg. He which doth otherwise, perverts & defiles with hated confusion the order and beauty, on which this Univers consists. Wherefore when I considered with my self, that I was a member of this great Mundane body, and that no altogether unprofitable; I endeavoured earnestly, that all men should be acquainted with my duty, and that it might be known how much I could profit every man. For God is my witnesse, and all good men known that I have now laboured fifty years with all care and pains in the illustration and amplification of Chirurgery; and that I have so certainly touched the mark whereat I aimed, that Antiquity may seem to have nothing wherein it may exceed us, beside the glory of invention; nor posterity any thing left but a certain small hope to add some things, as it is easie to add to former inventions. In performance whereof, I have been so prodigall of my self, my watchings, faculties and means, that I spared neither time, labour, nor cost, whereby I might satisfie and accomplish my own desires, this my great work, add the desires of the studious. Neither may we doubt but their studies would at length wax cold, if they only furnished with the Theorick and Precepts in Schools and that with much labour, should see no manuall operation, nor manifest way of performing the Art. For which cause I seeking the praise and profit of the French *Nation, even with the*

 hinder-

hinderance of my particular estate, have endeavoured to illustrate and increase Chirurgery, hitherto obscure either by the infelicity of the former ages, or the envy of the Professors; and not only with precepts and rules, but being a lover of carved works I beautified it with 300. forms, or graven figures, and apt delineations, in which whosoever shall attentively look shall find five hundred anatomicall or organicall figures belonging to the Art, (if they be reckoned particularly). To every of these I have given their names and shewed their use, lest they should seem to have been put in vainly for ostentation or delight. But although there be few men of this profession which can bring so much authority to their writings either with reason, or experience as I can; notwithstanding I have not been so arrogant, but intending to publish my work, I first communicated it with men the most excellent in the Art of Physick, who gave me greater incouragement to perfect and publish it, that it might be in common use: professing they wished nothing more, than that it might be turned into Latin, (so by which means it should bee known to forain Nations, that there is no kind of Learning which is not delivered with great dexterity of wit in this Kingdom over which you rule. And thus much I dare boldly affirm, that there is scarse any, be he never so stately or supercilious, but that he may here find some thing which may delight him, and by which he may better his knowlrdg. Therefore I doubted not to consecrate this book unto your Majesty both as a Pattern and treasury of my labours, aswell in respect of my duty, who am yours by nature and education, as that I might manifest to all, your Highnesse exceeding bounty towards me, in placing me, (having heretofore injoyed the office of principall Chirurgeon under three Kings your Majesties Predecessors) in the same dignity, and that of your own accord. And moreover I did conjecture that it would fall out, as now it doth, that this my work carried through the world by the fame of your Majesties name, should neither fear the face nor view of any, supported by the favour and Majesty of a most invincible Monarch *and most excellent and renowned Prince. Neither did King* Charles *the ninth of happy memory, incited by the relation of the most gracious Queen his Mother, refuse to read it, being he understood it proceeded from him, who having happily passed all his time in private and publike imployments, and conversed with all men of all sorts, was judged most worthy to obtain this favour, as to have the front of this work adorned and beautified with the splendor of his prefixed name. I encouraged by this hope, desired that my request should passe as by a certain continuation and succession from a most powerfull, to a most Invincible King; and do wholly consecrate these my labours taken for my Countries good unto your sacred Majesty. God grant that your Majesty may have happy successe of all your enterprises aboundantly added to* Nestors *years.*

Patis. 8. Feb: Anno Dom. 1579.

Your most Christian Majesties
faithfull Servant

Ambrose Parey.

The Preface.

MOst men derive the Originall of Phyſick from heaven; for thoſe who hold the beſt opinion of the Creation of the world, affirm, the Elements being created and ſeparated each from other, man being not as yet made; incontinently by the divine decree, all herbes and plants with infinite variety of flowers, endued with various ſents, taſtes, colours, and forms, grew and ſprung forth of the bowels of the Earth, enriched with ſo many and great vertues, that it may be thought a great offence to attribute to any other than the deity, the benefit of ſo great a bleſſing ſo neceſſary for ſo many uſes. Neither could Mans Capacity ever have attained to the knowledg of thoſe things without the guidance of the Divine power. For God the great Creator and faſhioner of the World, when firſt he inſpired *Adam* by the breath of his mouth into a living and breathing man, he taught him the nature, the proper operations, faculties and vertues of all things contained in the circuit of this Univerſe. So that if there be any who would aſcribe the glory of this invention to man, he is condemned of ingratitude even by the judgment of *Pliny*. But this knowledg was not buryed in oblivion with *Adam*: but by the ſame gift of God was given to thoſe whom he had choſen and ordained for Phyſick, to put their helping hands to others that ſtood in need thereof. Which opinion was not only received in the common manner and by the tacite conſent of all Nations, but confirmed by *Moſes* in the Scripture. Which thing *Jeſus* the ſon of *Sirach* the wiſeſt amongſt the Jews, hath confirmed ſaying; *Honor the Phyſitian with the honor due unto him, for the moſt High hath created him becauſe of neceſſity: and of the Lord cometh the gift of healing. The Lord hath created Medicins of the Earth, and he that is wiſe will not abhor them. Give place and honour to the Phyſitian, for God hath created him, let him not go from thee, for thou haſt need of him.* The *Græcians* who firſt ſeem more fully and with greater fame to have profeſſed the Art of Phyſick, do in a manner conſent with this opinion, in acknowledging *Apollo* to have been the inventer thereof, neither did they it without a reaſonable cauſe. For whether by *Apollo* they may underſtand the Sun who by its gentle and vitall heat doth bring forth, temper and cheriſh all things; or elſe ſome

Geneſ.1.
Eccleſ.38.1.

Heros,

Heros, who incited by an excellent and almoſt divine underſtanding firſt taught and put in practiſe the Medicinall vertues of Herbs; in which ſenſe *Ovid* brings him in ſpeaking thus:

Herbes are of mine invention, and through all
The world, they me the firſt Phyſitian call.

The originall of Phyſick ariſing from thoſe beginnings ſhall alwayes be celebrated, as celeſtiall, and was increaſed principally after this manner. After *Apollo*, *Æſculapius* his ſon inſtructed by his father reduced this Art being as yet rude and vulgar into a little better and more exquiſite form, for which cauſe he was reputed worthy to be accounted as one of the Gods. At the ſame time flouriſhed *Chiron* the *Centaure*, who for that he excelled in knowledg of Plants, and taught *Æſculapius* (as many report) their faculties, is thought by *Pliny* and ſome others to have been the inventor of Phyſick. *Æſculapius* had two ſons, *Podalirius* and *Machaon*, who following their fathers ſteps and profeſſing Phyſick, did principally beautifie and practiſe that part thereof which is called Chirurgery, and for that cauſe were accounted the Inventers thereof. After thoſe *Aſclepiades* left this Art much inlarged as hereditary to his poſterity; by whoſe ſtudy and diligence, that part of the Art was invented and annexed, which by a more curious skill ſearcheth and cureth thoſe diſeaſes which lye hid within the body. *Hippocrates* the *Coan* the ſon of *Heraclidas*, born of the noble race of *Aſclepiades*, Prince of the Phyſitians that were before him, perfected Phyſick and reduced it into an Art and wrote divers Books thereof in Greek. *Galen* ſucceeded him ſix hundred years after, who was a man moſt famous not only for his knowledg in Phyſick, but alſo in all other ſciences, who faithfully interpreting every thing that was obſcure and difficult in the writings of *Hippocrates*, enlarged the ſcience with many volumes. Thus therefore was the beginning, thus the increaſe and perfecting the Art of Phyſick, as much as can be hoped for from mans induſtry. Although indeed we cannot deny but that Experience hath much profited this Art, as it hath and doth many other. For as men perceived that ſome things were profitable, ſome unprofitable for this or that diſeaſe, they ſet it down, and ſo by diligent obſervation and marking of ſingularities, they eſtabliſhed univerſall and certain precepts and ſo brought it into an Art. For ſo we find it recorded in ancient Hiſtories, before the invention of Phyſick, that the *Babylonians* and *Aſſyrians* had a cuſtom amongſt them to lay their ſick and diſeaſed perſons in the porches and entries of their houſes, or to carry them into the ſtreets and market places, that ſuch as paſſed by and ſaw them, might give them counſel to take thoſe things to cure their diſeaſes, which they had formerly found profitable in themſelves or any other in the like affects, neither might any paſſe by a ſick man in ſilence.

Plin. l. 7. c. 2.

lence. Also *Strabo* writes that it was a custom in *Greece* that those which were sick should resort to *Æsculapius* his Temple in *Epidaurum*, that there as they slept, by their dreams they might be admonished by the God what means they should use to be cured; and when they were freed from their diseases, they writ the manner of their infirmities and the means by which they were cured in tables and fastened them to the pillars of the Temple, not only for the glory of the God, but also for the profit of such, as should afterwards be affected with the like maladies. All which tables (as fame reports) *Hippocrates* transcribed, and so from those drew the Art of Physick. Beasts also have added much to this Art. For one man was not only instructed by another, but learned also much from brute beasts, for they by the only instinct of nature have found out divers herbs, and remedies, by which they freed and preserved themselves from infirmities, which might presently be transferred to mans use. Wherefore considering that such and so many have concurred to bring this Art to perfection, who hereafter dare call in question the excellency thereof? chiefly if he respect the subject thereof, Mans body, a thing more noble than all other Mundane things, and for which the rest were created. Which thing moved *Herophilus* in times past to call Physitians *The hands of the Gods*. For as we by putting forth our hand, do help any man out of the water or mud into which he is fallen: even so we do sustain those that are thrown down from the top of health to the gates of death by violence of diseases, with happy medicins, and as it were by some speciall and divine gift deliver them out of the jaws of death. *Homer* the Prince of Greek Poets affirms that one Physitian is far more worthy than many other men. All Antiquity gave Physitians such honour, that they worshipped them with great veneration as Gods, or the sons of their Gods. For who is it which is not much delighted with the divine force of healthful medicins, with which (we see by dayly experience) Physitians, as armed with *Mercuries* rod, do bring back those languishing souls which are even entring the gates of death? Hence it cometh to passe that the divine Poets of ancient times, as *Orpheus*, and *Musæus*, and *Hesiod*, and the most renowned Philosophers, *Pythagoras*, *Plato*, *Aristotle*, *Theophrastus*, *Chrysippus*, *Cato Censorius*, and *Varro*, esteemed nothing more excellent than to excell in the knowledg of Medicins, and to testifie the same by written monuments to Posterity. For what can be more noble and worthy of a generous disposition than to attain to that by the benefit of Physick, that adorned with the ornaments of dignity thou mayest have power over other men, and favoured of Princes, Kings, and Emperours, mayest appoint and prescribe to them those things which are profitable to preserve health, and cure their diseases? But if you look for benefit by sciences;

ences;then know that the profeſſors hereof have beſide ſufficient gain,acquired much honour and many friends. *Hippocrates* coming to *Abdera* to cure *Democritus* of his madneſs, not only the men of the City,but alſo the women,children, and people of every age, ſexe and rank, went forth to meet him, giving him with a common conſent and loud voice the title of a *Tutelary* Deity and father of their Country. But the *Athenians*, for freeing their country from the plague,with triumphant pompe celebrated playes to his honour, and bountifully ſet upon his head as if he had been a King, a Crown of gold weighing a 1000. pieces of their golden coin,and erected his ſtatue,ſ a perpetuall monument of his piety and learning. *Eraſiſtratus* the Nephew of *Ariſtotle* by his daughter, received, freely given him by *Ptolomy* King of *Egypt*, for the cure of his ſon,100. Talents of Gold. The Emperour *Auguſtus* honoured *Antonius Muſa* with a golden ſtatue. *Quintus Stertinius* yearly received out of the Emperours Treaſury 12000.500. pieces of gold. In the time of our Grandfathers *Petrus Aponenſis* called *Conciliator* was ſo famous through all *Italy* for his knowledg in Phyſick, that he could ſcarſe be intreated to come to any man of faſhion that was ſick,unleſs he gave him 50. crowns, for every day he was abſent from home: but when hee went to cure *Honorius* the Biſhop of *Rome*, he received 400. crowns for every day he was abſent. Our *French* Chronicles relate in what credit & eſtimation *James Cotterius* the Phyſitian was with *Lewis* the 11. King of *France*; for they report he gave him monethly out of his Treaſury 10000. crowns. Phyſick in times paſt hath been in ſuch eſteem with many famous and noble perſonages,that divers Kings and Princes delighted with the ſtudy thereof,and deſirous to attain glory and credit thereby, called ſundry herbs after their own names. For ſo *Gentian* took its name of *Gentius* King of *Illyria*; the herb *Lyſimachia* of *Lyſimachus*, the King of *Macedon*,the *Mithridatick* herb or *Scordium*, of *Mithridates* the King of *Pontus* & *Bithinia*, *Achilla* of *Achylles*,*Centorie* of *Chiron* the *Centaure*; *Artemiſia* of *Artemiſia* the Queen of *Caria*. *Attalus* King of *Pergamus*,*Salomon* of *Judea*, *Evax* of *Arabia*, and *Iuba* the King *Mauritania*,were not only inflamed with a deſire of the knowledg of Plants; but either they have written books of it, or for the great commodity of poſterity,invented by their skil many choiſe antidotes compounded of divers ſimples;neither the deſire of learning this noble ſcience is yet altogether extinct. As may appear by that *Indian* plant *Tobaco*,called by ſome the noble herb, *Catherines* herb and *Medices* herb,but commonly the Queens herb, becauſe *Catherine Medices* the mother of our Kings,by her ſingular ſtudy and induſtry made manifeſt the excellent vertue it hath in curing malign ulcers and wounds, which before was unknown to the *French*. For theſe worthy men underſtood that their glory,

In what eſteem Phyſitians have formerly been.

Names given to Plants.

thus

thus faſtened and ingraffed into the deep, and as it were ever living roots of plants, would never decay; but ſhould be propagated to all poſterity in many ſucceeding ages, growing up with their ſprouting and budding ſhouts, ſtalks, flowers and fruits. Neither did theſe famous men whil'ſt they adorned this part of Phyſick ſuffer the other, which treats of the diſſection of mans body, be buried in oblivion, and without their knowledg; as inſtructed with the precepts and learning of the wiſeſt men, how artificiall and unimitable by mortall hand this fabrick of our body is. Neither is it probable that *Apis*, *Oſiris* and *Ptolomy* Kings of *Egypt*, *Solomon*, *Alexander* the great, *Mithridates*, *Attalus*, ſeeing they dedicated themſelves wholly to the contemplation of naturall things; neglected the uſe of Anatomy, and being men moſt deſirous to know themſelves, to have been ignorant of the ſtructure of their own bodies being the habitations of their ſouls immortal and made to the Image of God: ſeeing they obſerved with certain judgment the different lights of the Sun, Moon and Stars; and paſſed over ſo many lands, ſo many ſeas, ſo many regions, ſo far remote one from another, by wayes ſo terrible by reaſon of cold, uncouthneſs, darkneſs, by rocks, by fire and ſword, with great labour, charge and danger of life, only that they might ſatisfie their minds thurſting after the knowledg of things; and to have left untouched a thing truly noble, admirable, and moſt worthy of knowledg, eaſie to be attained by any and to be acquired without any danger of life, or fortunes.

Phyſick is divided into three parts.

Seeing there be three parts of that Phyſick which at this time we profeſſe, *Chirurgery* which by the uſe of the hand, *Diet* which with a convenient manner of feeding and ordering the body, and *Pharmacy* that by medicins attempt to expell diſeaſes, and preſerve health; The prime Phyſitians do not without reaſon contend wch of theſe may be accounted the chief. Certainly *Herophilus* had *Pharmacy* in ſuch eſteem, that he thought medicins were firſt mixed and adminiſtred to the ſick by *Apollo* (whom Antiquity thought a great Deity.) And *Pliny* had ſo good an opinion of Diet, that he exclaims; The true remedies and Antidotes againſt diſeaſes are put into the pot and eaten every day by the poor people. Verily all learned men confeſſe that the manner of curing which is performed by diet, is much more facile & proſperous, than that which is done by medicins; as thoſe things which ſought with much labor and coſt are taken with much loathing, and taken are ſcarce retained, but retained they oft work with much labour and pain: Which things long ago moved *Aſclepiades* to exclude the uſe of medicins, as hurtfull to the ſtomach. Yet if we will beleeve *Celſus*, neither of theſe parts merit the preheminence, but both of them give place to Chirurgery. For ſeeing that fortune is very powerfull in diſeaſes, and the ſame Meats and Medicins are often good and often vain, truly

truly it is hard to say, whether the health is recovered by the benefit of Diet and *Pharmacy*, or by the strength of the body. Moreover in those cases, in which we most prevail with medicins, although the profit be more manifest, yet it is evident that health is often sought in vain even by these things, and often recovered without them. As it may be perceived by some troubled with sore eyes, and others with Quartain feavers, who having been long troubled by Physitians are sometimes healed without them. But the effect of Chirurgery as it is very necessary, so it is the most evident amongst all the parts of physick. For who without Chirurgery can hope to cure broken, or luxated parts, who wounds and ulcers, who the falling of the matrix, the stone in the bladder, a member infested with a Gangrene or Sphacele? Besides, this part also is the most ancient; for *Podalirius* and *Machaon* following their Generall *Agamemnon* to the *Trojane* wars, yeelded no small comfort to their fellow Souldiers. Whom notwithstanding *Homer* affirms not to have given any help in the Pestilence, nor in divers other diseases, but only were accustomed to heal wounds by instruments and medicins.

The excellency of Chirurgery.

And if the difficulty of learning it argue the excellency of the Art, who can doubt but Chirurgery must be the most excellent, seeing that none ought to be accounted a Chirurgeon or which can perform his duty, without the knowledg of Diet and *Pharmacy*? But both the other can perform their parts without Chirurgery if we may beleeve *Galen*. But if we consider the matter more neerly according to truth; we shall understand those three parts have a certain common bond and are very near of kindred, so that the one implores the aid of the other; neither can the Physitian do any thing praise-worthy without the conspiracy and joint consent of these three; therefore in ancient times there was but one performer and user of all the three parts. But the multitude of men daily increasing, and on the contrary mans life decreasing, so that it did not seem able to suffice for to learn and exercise all the three, the workmen divided themselves. Wherefore that which happens to any man either by lot, or counsell, that let him follow, maintain and only use, as mindfull how short his life is, and how long the Art.

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AN

AN INTRODVCTION OR *COMPENDIOVS WAY TO* CHIRURGERY.

CHAP. I.

What Chirurgery is.

CHIRVRGERY is an Art, which teacheth the way by reason, how by the operation of the hand we may cure, prevent, and mitigate diseases, which accidentally happen unto us. Others have thought good to describe it otherwise; as that, It is that part of Physick which undertaketh the cure of Diseases by the sole industry of the Hand: as, by cutting, burning, sawing off, uniting fractures, restoring dislocations, and performing other works, of which we shall hereafter treat. Chirurgery also is thus defined by the Author of the *Medicinall Definitions*; The quick motion of an intrepid hand joyned with experience; or, an artificiall action by the hand used in Physick, for some convenient intent. Yet none must think to attain to any great perfection in this Art, without the help of the other two parts of Physick; I say, of Diet and Pharmacie, and the divers applications of proper Medicines, respecting the condition of the Causes, Diseases, Symptomes, and the like circumstances, which comprehended under the names of things naturall, not naturall, and besides nature, (as they commonly call them) we intend to describe in their proper place. But if any reply, that there be many which do the works of Chirurgery, without any knowledg of such like things, who notwithstanding have cured desperate Diseases with happy success: Let them take this for an answer, That such things happen rather by chance, than by the industry of the Art; and that they are not provident that commit themselves to such. Because that for some one happy chance, a thousand dangerous errors happen afterwards, as *Galen* (in divers places of his Method) speaks against the Empericks. Wherefore seeing we have set down Chirurgery to be a diligent operation of the hands, strengthened by the assistance of Diet and Pharmacy, we will now shew what, and of what nature the operations of it are.

The definition of Chirurgery.

What necessary for a Chirurgeon.

CHAP. II.

Of Chirurgicall Operations.

Twelve things are proper to the duty of a Chirurgeon; To take away that which is superfluous; to restore to their places such things as are displaced; to separate those things which are joyned together; to joyn those which are separated; and to supply the defects of nature. Thou shalt far more easily and happily attain to the knowledg of these things by long use and much exercise, than by much reading of Books, or daily hearing of Teachers. For speech, how perspicuous and elegant soever it be, cannot so vively express any thing, as that which is subjected to the faithfull eyes and hands.

The nature of a Chirurgeon.

Experience more necessary for a Chirurgeon, than Art.

Examples of taking away that which is superfluous.

We have examples of taking away that which abounds in the Amputation or cutting off a finger, if any have six on one hand, or any other monstrous member that may grow out: in the lopping off a putrefied part inwardly corrupted; in the extraction of a dead child, the secondine, mole, or such like bodies out of a womans womb: In taking down of all Tumors, as Wens, Warts, Polypus, Cancers, and fleshy excrescences of the like nature; in the pulling forth of bullets, of pieces of maile, of darts, arrows, shells, splinters, and of all kind of weapons in what part of the body soever they be. And he taketh away that which redounds, which plucks away the hairs of the ey-lids which trouble the ey by their turning in towards it: who cuts away the web, possessing all the * *Adnata*, and part of the * *Cornea*: who letteth forth suppurated matter: who taketh out stones in what part soever of the body they grow; who puls out a rotten or otherwise hurtfull tooth; or cuts a nail that runs into the flesh: who cuts away part of the *Uvula*, or hairs that grow on the ey-lids: who taketh off a Cataract; who cuts the navill or foreskin of a childe newly born; or the skinny caruncles of womens privities.

* Two tunicles of the eys.

Examples of replacing.

Examples of replacing those things which are out of their naturall site, are manifest in restoring dislocated bones; in re-placing of the guts and kall fallen into the cods, or out of the navill or belly by a wound; or of the falling down of the womb, fundament, or great gut, or the eye hanging out of its circle, or proper place.

Example of separating things joined together.

But we may take examples of disjoyning those things which are continued; from the fingers growing together, either by some chance, as burning; or by the imbecillity of the forming faculty: by the disjunction of the membrane called *Hymen*, or any other trouling the neck of the womb; by dissection of the ligament of the tongue, which hinders children from sucking and speaking, and of that which hinders the *Glans* from being uncovered of the foreskin; by the division of a varicous vein, or of a half cut nerve or tendon, causing convulsion; by the division of the membrane stopping the auditory passage, the nose, mouth, or fundament, or the stubborn sticking together of the hairs of the ey-lids. Refer to this place all the works done by Caustick, the Saw, Trepan, Lancet, Cupping-glasses, Incision-knife, Leeches, either for evacuation, derivation, or revulsion sake.

Examples of uniting things disjoined.

The Chirurgeon draws together things separated, which healeth wounds by stitching them, by bolstering, binding, giving rest to, and fit placing the part: which repairs fractures; restoring luxated parts: who by binding the vessel, stayeth the violent effusion of blood: who cicatriceth cloven lips, commonly called Hare-lips: who reduceth to equality the cavities of Ulcers and Fistula's.

Examples of supplying defects.

But he repairs those things which are defective either from the infancy, or afterwards by accident, as much as Art and Nature will suffer; who sets on an ear, an ey, a nose, one or more teeth; who fils the hollowness of the palat eaten by the Pox, with a thin plate of gold or silver, or such like; who supplies the defect of the tongue in part cut off, by some new addition; who fastens to a hand, an arm, or leg with fit ligaments, workmanlike: who fits a doublet bumbasted, or made with iron plates to make the body streight; who fils a shoo too big with cork, or fastens a stocking or sock to a lame mans girdle to help his gate. We will treat more fully of all these in our following Work. But in performing those things with the hands, we cannot but cause pain: (for who can without pain cut off an arm, or leg, divide and tear asunder the neck of the bladder, restore bones put out of their places, open Ulcers, bind up wounds, and apply cauteries, and do such like?) notwithstanding the matter often comes to that pass, that unless we use a judicious hand, we must either die, or lead the remnant of our lives in perpetuall misery. Who therefore can justly abhor a Chirurgeon for this, or accuse him of cruelty? or desire they may be served, as in ancient times the Romans served *Archagatus*, who at the first made him free of the City; but presently after, because he did somewhat too cruelly burn, cut, and perform the other works of a good Chirurgeon, they drew him from his house into the *Campus Martius*, and there stoned him to death, as we read it recorded by *Sextus Cheronæus*, *Plutarch*'s nephew by his Daughter. Truly it was an inhumane kind of ingratitude, so cruelly to murder a man intent to the works of so necessary an Art. But the Senate could not approve the act, wherefore to expiate the crime as well as then they could, they made his Statue in Gold, placed it in *Æsculapius* his Temple, and dedicated it to his perpetuall memory. For my part, I very well like that saying of *Celsus*: A Chirurgeon must have a strong, stable, and intrepid hand, and a mind resolute and mercilesse; so that to heal him he taketh in hand, he be not moved to make more haste than the thing requires; or to cut less than is needfull; but which doth all things as if he were nothing affected with their cries; not giving heed to the judgment of the vain common people, who speak ill of Chirurgeons because of their ignorance.

Archagatus the Chirurgeon.

In præfat. lib. 7.

The properties of a good Chirurgeon.

CHAP.

CHAP. III.

of things Naturall.

THat the Chirurgeon may rightly, and according to Art perform the foresaid works, he must set before his eys certain Indications of working: Otherwise he is like to become an Emperick, whom no Art, no certain reason, but only a blind temerity of fortune moves to boldness and action. These Indications of actions are drawn from things (as they call them) naturall, not naturall, and besides nature, and their adjuncts, as it is singularly delivered of the Ancients, being men of an excellent understanding. Wherefore we will prosecute according to that order, all the speculation of this Art of ours. First therefore things Naturall are so termed, because they constitute and contain the nature of mans body, which wholly depends of the mixture and temperament of the four first bodies, as it is shewed by *Hippocrates* in his book *de Natura humana*: wherefore the consideration thereof belongs to that part of Physick, which is named *Physiologia*; as the examination of things not naturall to *Diætetice*, or Diet, because by the use of such things it endevours to retain and keep health: but *Therapeutice*, or the part which cures the Diseases, and all the affects besides nature, challenges the contemplation of those things which are not agreeable to nature. But the things which are called Naturall, may be reduced to seven heads: besides which there comes into their fellowship, those which we term annexed.

From whence we must draw Indications.

What things are called naturall.

To what part of physick things not naturall pertain.

To what things besides nature.

The seven principall heads of things Naturall; are: *Elements*, *Temperaments*, *Humors*, *Parts or members*, *Faculties*, *Actions*, *Spirits*.

To these are annexed, and somewhat near; *Age*, *Sex*, *Colour*, *Composure*, *Time or season*, *Region*, *Vocation of life*.

CHAP. IIII.

Of Elements.

AN Element (by the definition which is commonly received amongst Physitians) is the least and most simple portion of that thing which it composeth: or that my speech may be the more plain: the four first and simple bodies are called Elements; Fire, Air, Water, and Earth; which accommodate and subject themselves as matter to the promiscuous generation of all things which the Heavens engirt, whether you understand things perfectly, or unperfectly mixed. Such Elements are only to be conceived in your mind, being it is not granted to any externall sense to handle them in their pure and absolute nature. Which was the cause that *Hippocrates* expressed them not by the names of substances, but of proper qualities, saying, Hot, Cold, Moist, Dry; because some one of these qualities is inherent in every Element, as his proper and essentiall form, not only according to the excess of latitude, but also of the active faculty; to which is adjoined another simple quality, and by that reason principall, but which notwithstanding attains not to the highest degree of his kind, as you may understand by *Galen* in his first book of Elements. So, for example sake, in the Air we observe two qualities, Heat and Moisture, both principall, and not remitted by the commixture of any contrary quality, for otherwise they were not simple. Therefore thou maist say, What hinders that the principall effects of heat shew not themselves as well in the Air, as in the Fire? because, as we said before, although the Air have as great a heat according to his nature, extent, and degree, no otherwise than Fire hath, yet it is not so great in its active quality. The reason is, because that the calfactory force in the Air is hindered, and dulled by society of his companion and adjoyned quality, that is, Humidity which abateth the force of heat, as on the contrary, driness quickneth it. The Elements therefore are endewed with these qualities.

What an Element is.

Elements are understood by reason, not by sense.

Why *Hipp.* expressed the Elements by these names of qualities.

Two principal qualities are in each Element.

Why the Air heats not so vehemently, as the Fire.

Names of the substances: *Fire*, *Air*, *Water*, *Earth* — is — *Hot and dry*, *Moist and hot*, *Cold and moist*, *Cold and dry*. — Names of the qualities.

These four Elements in the composition of naturall bodies, retain the qualities they formerly had, but that by their mixture and meeting together of contraries, they are somewhat tempered and abated. But the Elements are so mutually mixed one with another, and all with all, that no simple part may be found; no more than in a mass of the Emplaister *Diacalcitheos* you can shew any *Axungia* oil, or Litharge by it self; all things are so confused and

How the Elements may be understood to be mixed in compound bodies.

and united by the power of heat, mixing the ſmalleſt particulars with the ſmalleſt, and the whole with the whole, in all parts. You may know and perceive this concretion of the four Elementary ſubſtances in one compound body, by the power of mixture, in their diſſolution by burning a pile or heap of green wood: For the flame expreſſes the Fire; the ſmoke, the Air; the moiſture that ſweats out at the ends, the Water; and the aſhes, the Earth: You may eaſily perceive by this example ſo familiar and obvious to the ſenſes, what diſſolution is, which is ſucceeded by the decay of the compound body; on the contrary, you may know that the coagmentation, or uniting and joyning into one of the firſt mixed bodies is ſuch, that there is no part ſincere or without mixture. For if the heat which is predominant in the fire, ſhould remain in the mixture in its perfect vigor, it would conſume the reſt by its pernicious neighborhood; the like may be ſaid of Coldneſs, Moiſture, and Drineſs; although of theſe qualities, two have the title of Active, that is, Heat and Coldneſs, becauſe they are the more powerfull; the other two Paſſive, becauſe they may ſeem more dull and ſlow, being compared to the former. The temperaments of all ſublunary bodies ariſe from the commixture of theſe ſubſtances and elementary qualities, which hath been the principall cauſe that moved me to treat of the Elements. But I leave the force and effects of the Elementary qualities to ſome higher contemplation, content to have noted this, that of theſe firſt qualities, (ſo called, becauſe they are primarily and naturally in the four firſt bodies) others ariſe and proceed, which are therefore called the ſecond qualities: as of many, theſe, Heavineſs, Lightneſs, variouſly diſtributed by the four Elements, as the Heat or Coldneſs, Moiſtneſs or Drineſs have more power over them. For of the Elements, two are called light, becauſe they naturally affect to move upwards: the other two heavie, by reaſon they are carryed downward by their own weight. So we think the fire the lighteſt, becauſe it holds the higheſt place of this lower world; the Air, which is next to it in fite, we account light; for the water which lies next to the Air, we judg heavie; and the earth the center of the reſt we judg to be the heavieſt of them all. Hereupon it is, that light bodies, and the light parts in bodies, have moſt of the lighter Elements; as on the contrary heavie bodies have more of the heavier. This is a brief deſcription of the Elements of this frail world, which are only to be diſcerned by the underſtanding, to which I think good to adjoin another deſcription of other Elements, as it were ariſing or flowing from the commixture of the firſt: For beſides theſe, there are ſaid to be Elements of generation, and Elements of mans body. Which as they are more corporall, ſo alſo are they more manifeſt to the ſenſe. By which reaſon *Hippocrates* being moved, in his Book *de Natura humana*, after he had deſcribed the nature of Hot, Cold, Moiſt, and Dry, he comes to take notice of theſe by the order of compoſition. Wherefore the Elements of our generation, as alſo of all creatures which have blood, are ſeed and menſtruous blood. But the Elements of our bodies, are the ſolid and ſimilar parts ariſing from thoſe Elements of generation. Of this kind are bones, membranes, ligaments, veins, arteries, and many others manifeſt to the eys, which we will deſcribe at large in our Treatiſe of Anatomie.

Why of the firſt qualities, two are active, and two paſſive.

Why the firſt qualities are ſo called.

What the ſecond qualities are.

What Elements light, what heavy.

What the Elements of generation are.

What the Elements of mixt bodies.

CHAP. V.

Of Temperaments.

What a Temperament is.

A Temperament is defined, a proportionable mixture of hot, cold, moiſt, and dry; or, it is a concord of the firſt diſagreeing faculties. That harmony ſprings from the mixture of the four firſt bodies of the world. This whether Temperament or Concord is given to Plants and brute Beaſts for the beginning of their life, and ſo conſequently for their life and form. But as Plants are inferior in order and dignity to beaſts, ſo their * life is more baſe and infirm, for they have only a growing faculty, by which they may draw an Alimentary juice from the earth, as from their mothers breaſts, to preſerve them and their life, by which they may grow to a certain bigneſs; and laſtly, by which they may bring forth their like for the perpetuall continuance of their kind. But the * life of beaſts, have to the three former, the gift of ſenſe annexed: by benefit whereof, as by a certain inward knowledg they ſhun thoſe things that are hurtfull, and follow thoſe which profit them; and by the power of their will, they move themſelves whither they pleaſe. But the ſoul of man far more perfect and noble than the reſt, ariſeth not from that earthly mixture and temper of the Elements, but acknowledgeth and hath a far more divine off-ſpring; as we ſhall teach hereafter.

+ *Anima.* What the life performs in Plants.

* *Anima.* What in beaſts. Mans ſoule comes from above.

The manifold diviſion of a Temperament.

A Temperament, *ad Pondus.*

They divide a Temperament at the firſt diviſion, into two kinds; as one a temperate, another an untemperate. The untemperate is of two ſorts: The one wholly vicious, which hath altogether exceeded the bounds of mediocrity: The other, which hath ſomewhat ſtrayed from the mediocrity of temper, but notwithſtanding is yet contained within the limits of health: as that which brings no ſuch evident harm to the actions, but that it ſomewhat hinders them, ſo that they cannot ſo well and perfectly perform their duties. But the vicious Temperament doth three manner of wayes corrupt the functions, either by weak-

weakning, depraving, or aboliſhing them. For ſo ſtupor, or aſtoniſhment, diminiſheth and ſloweth the quickneſs of motion; convulſion depraves it; the Palſie aboliſheth it, and taketh it away. The temperate Temperament is alſo divided into two kinds; which is either to equality of weight or juſtice. It is called a Temperature to weight which ariſeth from the equall force of exactly concurring qualities, and as placed in a perfect ballance, draws down neither to this nor that part. They think the example of this Temperament to appear in the inner skin of the fingers ends of a man tempered to Juſtice. For ſeeing the moſt exquiſite touch reſides there, they ought to be free from all exceſs of contrariety; for otherwiſe being corrupted by too much heat or cold, moiſture or drineſs, they could give no certain judgment of the tangible qualities. For which thing nature hath excellently provided in the fabrick and coagmentation of the parts, of which the skin conſiſts. For it is compoſed of hot and moiſt fleſh, and therefore ſoft, and of a tendon and nerve cold and dry, and therefore hard; which are not only equally fitted and conjoyned, but wholly confuſed and mixed together, by which it comes, that removed from all extremes of oppoſition, it is placed in the midſt, as a rule to judg of all the exceſſes that happen to the touch. So it was fit the eye, which was to be the inſtrument of ſight, ſhould be tinctured with no certain colour, that it might be the leſs deceived in the judgment of colours. So it was convenient the hearing ſhould not be troubled with any diſtinct ſound, whereby it might more certainly judg of equall and unequall ſounds, not diſtinguiſhed by a ratable proportion; neither was it fit the tongue ſhould have any certain taſte, leſt the acceſs of that taſte ſhould deceive it in knowing and judging of ſo many different taſtes. The Temperature tempered to juſtice, is that, which although it is a little abſent from the exact and ſevere parility of mixed qualities, yet hath that equality which doth fully and abundantly ſuffice for to perform all the functions fitly and perfectly, which nature doth require, wherefore we can judg no otherwiſe of it than by the integrity of the Actions. For hence it took its name; for as diſtributive juſtice equally gives to every one rewards, or puniſhment according to their deſerts; ſo Nature, having regard to all the parts of the body, gives them all that temper which may ſuffice to perform thoſe duties, for which they are ordained. Let us for an example conſider a Bone; no man doubts, but that, like as the other ſimilar parts of the body, proceeds from the mixture of the four Elements: but nevertheleſs nature weighing the uſe of it, and ordaining it to ſupport the reſt of the body, would have more of the terrene and dry Element infuſed into it, that it might be the ſtronger and firmer to ſuſtain weight. But a Ligament, ſeeing it was made for other uſes, hath leſs of that earthly drineſs than the bone, but more than the fleſh, altogether fitted to its nature. So it hath ſeemed good to nature to endue all the parts of the body, not only with an equall portion, but alſo proportion of Elements and qualities; we call that a Temperament to juſtice: and we ſay, that it is in Plants, brute Beaſts, and all naturall bodies, which enjoy that temper and mediocrity, which may be agreeable to their nature. Hereupon by compariſon ariſe eight kinds of intemperate tempers: As

Ad pondus, vel ad juſtitiam.

A Temperament *ad juſtitiam.*

The temperament of a bone.

The kindes of untemperate tempers.

Four ſimple { *Hot* / *Cold* } temperate in { *Drineſſe* and *Moiſture.* }
Four ſimple { *Moiſt* / *Dry* } temperate in { *Heat* and *Cold.* }

Four compounds { *Hot* and *Moiſt*; *Hot* and *Dry*; *Cold* and *Moiſt*; *Cold* and *Dry.* }

But theſe Temperaments are either of the whole Body, or of ſome part thereof;

And that either { Principal, as { the *Brain*, the *Heart*, the *Liver*, the *Stones.* } Or
Of the reſt of the parts compoſed of other which have no principality in the body. }

Again, ſuch Temperaments are either healthfull, which ſuffice perfectly to perform their actions; or unhealthfull, which manifeſtly hurt them, the ſignes whereof may be read deſcribed by *Galen.* And you muſt obſerve that when we ſay the body, or any part of it is hot, we underſtand more hot than is fit for one of that kinde which is tempered to juſtice; as when we ſay a man hath a hot liver, we mean his liver is hotter, than a man juſtly tempered ſhould have; for all other tempers, whether of the whole body, or any of the parts thereof, are to be referred to this; and in the cure of diſeaſes we muſt look upon it, as the mark, and labour to preſerve it by the uſe of convenient things, as much as lies in our power. Wherefore, becauſe it is very neceſſary to know the diſtinction of Temperaments, I have thought

Lib. 2. de Temper. & in Artemedica.

thought good in this place, briefly to handle the Temperaments of the parts of the body, ages, ſeaſons of the year, humors, and medicines. Therefore the temperaments of the parts of our body are of this nature, not only by the judgment of the touch of a mans hand, which is juſtly tempered, (who is often deceived by flowing heat, which ſpread from the heart into all the body, imparts a certain kind of heat to all the parts) but alſo by the rule of their reaſon, compoſure and ſubſtance, as

What the temperaments of mans body are.

A Bone is the moſt dry and cold.
A Griſle leſs than it.
A Ligament leſs than a Griſle.
A Tendon is ſo much dryer and colder than the membrane, by how much it in the ſame temper exceeds a Vein and Artery. Then follow the harder Veins, for the ſofter are in a middle temper of dryneſs and moiſture, like as the skin; although all, both ſoft and hard, are of a cold temper. Wherefore all theſe parts of their own nature are cold and without blood: although the Veins and Arteries wax hot, by reaſon of the heat of the blood they contain, which notwithſtanding alſo borroweth that heat from the heart, as a part moſt hot, and ſofter than the skin; the liver next followeth the heart, in the order of the hotter parts, which is far ſofter than the skin it ſelf: for it, according to *Galens* opinion, the heart is ſomewhat leſs hard than the skin, and that is far harder than the liver, as appears by touching them, it muſt neceſſarily follow that the liver much exceeds the skin in ſoftneſs; I underſtand the skin ſimple, and ſeparated from the fleſh lying under it, to which it firmly cleaves. The fleſh is more moiſt and hot than the skin, by reaſon of the blood diſperſed in it. The ſpinall marrow is colder and moiſter than the skin; but the brain ſo much exceeds it in moiſture, as it is exceeded by the fat. The lungs are not ſo moiſt as the fat; and the ſpleen, and kidneys are of the like nature, and nevertheleſs they are all moiſter than the skin.

Ad finem, lib. de temper.

The temperaments of ages.

According to the diverſities of ages, the temperaments both of the whole body, and all its parts, undergo great mutations; for the bones are far harder in old men than in children, becauſe our life is, as it were, a certain progreſs to dryneſs; which when it comes to the height, conſequently cauſeth death. Wherefore in this place we muſt ſpeak of the Temperaments of ages, when firſt we ſhall have defined what an age is. Therefore an age is defined, A ſpace of life in which the conſtitution of the body of its ſelf and own accord, undergoeth manifeſt changes. The whole courſe of life hath four ſuch Ages. The firſt is Childhood, which extends from the birth to the eighteenth year of age, and hath a hot and moiſt temper, becauſe it is next to the hot and moiſt beginnings of life, ſeed, and blood. Youth followeth this, which is prolonged from the eighteenth to the twenty fifth year, and is temperate, and in the midſt of all exceſſes. Mans eſtate ſucceedeth youth, which they deny to extend beyond the thirty fifth year of age, in its proper temper it is hot and dry; whereby it cometh to paſs that then the heat is felt more acride and biting, which in childhood ſeemed milde; becauſe the progreſs of the life to dryneſs, hath much waſted the native humidity.

What an age is.

Old-age divided into two parts.

* Three degrees of the ſecond part of Old-age.

Then ſucceeds Old-age, ever divided into two parts; the firſt whereof extends from the thirty fifth, to the forty ninth year; thoſe of this age are called Old-men, (**but we commonly call them middle-ag'd men.*) The latter is, as it were, divided by *Galen* into three degrees; the firſt whereof are thoſe, who having their ſtrength ſound and firm, undergo civil affairs and buſineſſes: which things thoſe which are in the ſecond degree of Old-age cannot do, becauſe of the debility of their now decaying ſtrength: but thoſe which are in the laſt degree, are afflicted with moſt extreme weakneſs and miſery, and are as much deprived of their ſenſes and underſtanding, as of the ſtrength of their bodies; whereof aroſe this Proverb, *Old men, twice children.* Thoſe Old men of the firſt rank are pleaſant and curteous; and thoſe we ſay, are beginning to grow Old, or in their green Old-age; thoſe of the ſecond ſort delight in nothing but the boord and bed; but old decrepit men of the laſt order, think of nothing elſe, than their graves and monuments. Their firm and ſolid parts are of a cold and dry temperature, by reaſon of the decay of the radicall moiſture, which the inbred heat cauſeth in the continuance of ſo many years. Which thing may happen in a ſhort ſpace, by the vehement flame of the ſame naturall heat, turned by fevers into a fiery heat. But if any to prove Old men moiſt, will object, That they cough up, and ſpit much, I will anſwer him, as an old Doctor once ſaid; That a pitcher filled with water, may pour forth much moiſture; yet no man will deny but that ſuch a veſſel of its own terrene nature and matter is moſt dry; ſo old men may plainly be affirmed to be moiſt, by reaſon of their defect of heat, and abundance of excrements. But this deſcription of ages is not to be taken ſo ſtrictly as alwayes to be meaſured by the ſpaces and diſtances of years, for there are many which by their own miſdemeanor ſeem elder at forty, than others do at fifty.

Old men have their ſolid parts dry.

A compariſon of the four ages to the four ſeaſons of the year

Laſtly, the famous Philoſopher *Pythagoras* divided mans life into four ages, and by a certain proportion compared the whole courſe thereof to the four ſeaſons of the year; as Childhood to the Spring, in which all things grow and ſprout out, by reaſon of plenty and abundance of moiſture. And Youth to the Summer, becauſe of the vigor and ſtrength which men enjoy at that age. And mans eſtate, or conſtant age, to Autumn; for that then

after

after all the dangers of the fore-paſſed life, the gifts of diſcretion and wit acquire a ſeaſonableneſs or ripeneſs, like as the fruits of the earth enjoy at that ſeaſon. And laſtly, he compares Old-age to the ſterile and fruitleſs Winter, which can eaſe and conſolate its tediouſneſs by no other means, than the uſe of fruits gathered and ſtored up before, which then are of a cold and troubleſome condition. But for extreme Old-age, which extends to eighty or a hundred years, it is ſo cold and dry, that thoſe which arrive at that decrepit age are troubleſome, harſh, touchy, froward, crabby, and often complaining, untill at the length deprived of all their ſenſes, tongue, feet, and underſtanding, they doting, return again to childiſhneſs, as from the ſtaff to the ſtart. And thus much of the Temperaments of ages.

The tempers of the ſeaſons of the year.

But now in like manner we will explain the Temperatures of the ſeaſons of the year, which are four; the Spring, Summer, Autumn, Winter. The Spring continues almoſt from the twelfth or thirteenth day of March to the midſt of May; *Hippocrates* ſeemeth to make it hot and moiſt; which opinion ſeemeth not to have ſprung from the thing it ſelf, but from an inveterate error of the ancient Philoſophers, who would fit the Temperaments of the four ſeaſons of the year, as anſwering in proportion to the temperatures of the four ages. For if the matter come to a juſt tryall, all men will ſay, the Spring is temperate, as that which is in the midſt of the exceſs of heat, cold, moiſture and drineſs; not only by compariſon, becauſe it is hotter than Summer, and colder than Winter; but becauſe it hath that quality of its own proper nature. Wherefore it is ſaid of *Hippocrates*, The Spring is moſt holeſome, and leaſt deadly; if ſo be that it keep its native temper, from which if it decline, or ſucceed a former untemperate ſeaſon, as Autumn or Winter, it will give occaſion to many diſeaſes deſcribed by *Hippocrates*; not that it breeds them, but becauſe it brings them to ſight, which before lay hid in the body. Summer is comprehended in the ſpace of almoſt four months; it is of a hot and dry temper, a breeder of ſuch diſeaſes as proceed from choler, becauſe that humor at this time is heaped up in many bodies by aduſtion of blood bred in the Spring; but all ſuch diſeaſes do ſpeedily run their courſe. The beginning of Autumn, is from the time the Sun enters into Libra, and endures the like ſpace of time as the Spring. But when it is dry, it hath great inequality of heat and cold, for the mornings and evenings being very cold, the noondays on the contrary are exceeding hot. Wherefore many diſeaſes are in Autumn, and then long and deadly, eſpecially if they incline towards Winter; becauſe all daily and ſodain changes to heat and cold are dangerous. The Winter poſſeſſes the remnant of the year, and is cold and moiſt, it increaſes naturall heat, ſtirs up the appetite, and augments Phlegme. It encreaſes heat by *Antiperiſtaſis*, or contrariety of the encompaſſing air, which being then cold, prohibits the breathing out of heat: whereby it happens that the heat being driven in and hindered from diſſipation, is ſtrengthened by co-uniting its forces. But it augments Phlegme, for that men are more greedy, the Appetite being encreaſed by the ſtrengthened heat: from whence proceeds much crudity, and a large ſtore of diſeaſes, eſpecially Chronick or Long, which ſpread and encreaſe rather in this winter-ſeaſon than in any other part of the year. To this diſcourſe of the temper of the ſeaſons of the years, is to be revoked the variety of tempers which happens every day, which certainly is not to be neglected, that there may be place of election, eſpecially if nothing urge. For hither belongs that ſaying of *Hippocrates*; When in the ſame day it is one while hot, another cold, Autumnall diſeaſes are to be expected. Therefore an Indication taken from hence is of great conſequence to the judgment of diſeaſes; for if it agree with the diſeaſe, the diſeaſe is made more contumacious, and difficult to cure. Whereupon the Patient and Phyſitian will have much trouble; but if on the contrary it reclaim and diſſent, the health of the Patient is ſooner to be expected. Neither is it a thing of leſs conſequence to know the cuſtoms and habits of the places and Countreys in which we live; as alſo the inclination of the Heavens, and temperature of the Air; but let us leave theſe things to be conſidered by Naturall Philoſophers, that we may deliver our judgment of the temperaments of *Humors*. Blood, as that which anſwers to the Air in proportion, is of a hot and moiſt nature, or rather temperate, as *Galen* teſtifies; for, ſaith he, it is certain and ſure, that the Blood is neither hot nor moiſt, but temperate, as in its firſt compoſure none of the four firſt Qualities exceeds other by any manifeſt exceſs, as he repeats it upon the 39th Sentence. Phlegm, as that which is of a wateriſh nature, is cold and moiſt; no otherwiſe than Choler being of a fiery temper, is hot and dry. But Melancholy aſſimilated to earth, is cold and dry. This which we have ſpoken in generall of Phlegm and Melancholy, is not always true in every kind of the ſaid Humors. For ſalt Phlegm is of a hot and dry temperature; as alſo all kinds of Melancholy which have aroſe or ſprung by aduſtion from the native and alimentary, as we will teach in the following Chapter. Now the temperaments of Medicines have not the ſame form of judgment, as thoſe things which we have before ſpoken of; as, not from the Elementary quality, which conquering in the contention and mixture, obtains the dominion; but plainly from the effects, which taken or applyed, they imprint in a temperate body. For ſo we pronounce thoſe things, hot, cold, moiſt, or dry, which produce the effects of Heat, Coldneſs, Moiſture, or Dryneſs. But we will defer the larger explication of theſe things to that place, where we have peculiarly appointed

How the ſpring is temperate.

Aphor. 9. ſect. 3.

Aphor. 20. ſect. 3.

Autumn unequall.

How Winter encreaſes the native heat.

Aphor. 4 ſect. 3.

The temperaments of Humors.

Lib. de natura humana, ad ſent. 36. Sect. 1.

The temperature of the Blood.

From whence we judg of the temperature of Medicines.

appointed to treat of Medicines; where we will not ſimply enquire whether they be hot or cold, but what degree of heat and cold, or the like other quality: in which ſame place we will touch the temperature and all the nature of taſtes, becauſe the certaineſt judgment of Medicines is drawn from their taſtes: Hitherto of Temperaments; now we muſt ſpeak of Humors, whoſe uſe in Phyſicall ſpeculation is no leſs than that of Temperaments.

CHAP. VI.

Of Humors.

The knowledg of the Humor is neceſſary. Lib. *De natura Humana.*

TO know the nature of *Humors*, is a thing not only neceſſary for Phyſitians, but alſo for Chirurgeons, becauſe there is no diſeaſe with matter which ariſeth not from ſome one, or the mixture of more *Humors*. Which thing *Hippocrates* underſtanding, writ, every Creature to be either ſick or well according to the condition of the *Humors* in the body. And certainly all putrid feavers proceed from the putrefaction of *Humors*. Neither do any acknowledg any other originall or diſtinction of the differences of Abſceſſes or Tumors: neither do ulcerated, broken, or otherwiſe wounded members hope for the reſtauration of continuity, from other than from the ſweet falling down of Humors to the wounded part. Which is the cauſe that often in the cure of theſe affects, the Phyſitians are neceſſarily buſied in tempering the Blood, that is, bringing to a mediocrity the four Humors compoſing the maſs of blood, if they at any time offend in quantity, or quality. For whether if any thing abound or digreſs from the wonted temper in any exceſs of heat, cold, viſcoſity, groſneſs, thinneſs, or any ſuch like quality, none of the accuſtomed functions will be well performed. For which cauſe thoſe chief helps to preſerve and reſtore health have been divinely invented: *Phlebotomie*, or blood-letting, which amends the quantity of too much blood; and Purging, which corrects and draws away the vicious quality. But now let us begin to ſpeak of the Humors, taking our beginning from the definition.

The helps of Health.

What an Humor is.

An Humor (is called by Phyſitians) what thing ſo ever is liquid and flowing in the body of living Creatures endued with Blood, and that is either naturall, or againſt nature. The naturall is ſo called becauſe it is fit to defend, preſerve and ſuſtain the life of a Creature. Quite different is the nature and reaſon of that which is againſt nature. Again, the former is either Alimentary or Excrementitious: The Alimentary which is fit to nouriſh the body, is that Humor which is contained in the veins and arteries of a man which is temperate and perfectly well; and which is underſtood by the generall name of Blood, which is let out at the opening of a vein. For Blood otherwiſe taken, is an Humor of a certain kind, diſtinguiſhed by heat and warmneſs from the other Humors comprehended together with it, in the whole maſs of the blood. Which thing, that it may the better be underſtood, I have thought good in this place to declare the generation of Blood by the efficient and materiall cauſes. All things which we eat or drink, are the materials of Blood; which things drawn into the bottom of the Ventricle by its attractive force, and there detained, are turned by the force of concoction implanted in it, into a ſubſtance like to Almond-butter. Which thing, although it appear one and like it ſelf, yet it conſiſts of parts of a different nature, which not only the variety of meats, but one and the ſame meats yeelds of it ſelf. We term this *Chylus*, (when it is perfectly concocted in the ſtomach.) But the * Gate-vein receives it driven from thence into the ſmall Guts, and ſucked in by the Meſeraick-veins, and now having gotten a little rudiment of change in the way, carries it to the Liver, where by the Blood-making faculty, which is proper and naturall to this part, it acquires the abſolute and perfect form of Blood. But with that Blood, at one and the ſame time and action all the Humors are made, whether alimentary or excrementitious. Therefore the Blood, that it may perform its office, that is, the faculty of nutrition, muſt neceſſarily be purged and cleanſed from the two excrementitious Humors: of which the bladder of Gall draws one, which we call yellow Choler; and the Spleen the other, which we term Melancholy. Theſe two Humors are naturall, but not alimentary or nouriſhing, but of another uſe in the body, as afterwards we will ſhew more at large. The Blood freed from theſe two kinds of Excrements, is ſent by the veins and arteries into all parts of the body for their nouriſhment. Which although then it ſeem to be of one ſimple nature, yet notwithſtanding it is truly ſuch, that four different and unlike ſubſtances may be obſerved in it, as, Blood, properly ſo named, Phlegm, Choler, and Melancholy, not only diſtinct in colour, but alſo in taſte, effects, and qualities. For, as *Galen* notes in his book *de Natura humana*, Melancholy is acide or ſour, Choler bitter, Blood ſweet, Phlegm unſavory. But you may know the variety of their effects, both by the different temper of the nouriſhed parts, as alſo by the various condition of the diſeaſes ſpringing from thence. For therefore ſuch ſubſtances ought to be tempered and mixed amongſt themſelves in a certain proportion, which remaining, health remains; but violated, diſeaſes follow. For all acknowledg, that an *Oedema* is cauſed by Phlegmatick; a *Scirrhus*, by Melancholick; an *Eryſipelas*, by Cholerick; and a *Phlegmone*, by

The manifold diviſion of Humors.

The materiall and efficient cauſes of Blood

What the *Chylus* is.

* *Vena porta.*

Where the Blood is perfected.

The receptacles of Choler and Melancholy.

Four unlike Humors in the Blood.

pure

pure and laudable blood. *Galen* teaches by a familiar example of new wine presently taken from the Press, that these 4 substances are contained in that one mass, and mixture of the blood. In which every one observes 4 distinct Essences; for the flower of the wine working up, swims at the top, the dregs fall down to the bottom, but the crude and watery moisture, mixed together with the sweet and vinous liquor, is every where diffused through the body of the wine: the flower of the wine, represents Choler, which bubbling up on the superficies of blood, as it concretes and grows cold, shineth with a golden colour; the dregs, Melancholy, which by reason of its heavinesse ever sinketh downward, as it were, the mud of the blood; the crude and watery portion, Phlegm; for as that crude humor, except it be rebellious in quantity, or stubborn by its quality, there is hope it may be changed into wine, by the naturall heat of the wine; so Phlegm, which is blood half concocted, may by the force of native heat be changed into good and laudable blood. Which is the cause that nature decreed or ordained no peculiar place as to the other 2 Humors, whereby it might be severed from the blood: But the true and perfect liquor of the wine represents the pure blood, which is the more laudable and perfect portion of both the humors of the confused mass. It may easily appear by the following scheme, of what kind they all are, and also what the distinction of these four Humors may be.

A comparison of blood and new wine.

Phlegm is Blood half concocted. Why it hath no proper receptacle.

	NATURE.	CONSISTENCE.	COLOUR.	TASTE.	USE.
Blood is	*Of Nature aery, hot, and moist, or rather temperate.*	*Of indifferent consistence, neither too thick nor too thin.*	*Of Colour red, rosie, or crimson.*	*Of Taste sweet.*	*Of such use, that it chiefly serves for the nourishment of the fleshy parts, and carryed by the vessels, imparts heat to the whole body.*
Phlegm is	*Of Nature watery, cold and moist.*	*Of Consistence, liquid.*	*Of Colour, white.*	*Of Taste, sweet, or rather unsavory, for we commend that water which is unsavory.*	*Fit to nourish the brain, and all the other cold and moist parts, to temper the heat of the blood, and by its slipperinesse to help the motion of the joynts.*
Choler is	*Of Nature fiery, hot and dry.*	*Of Consistence, thin.*	*Of Colour yellow, or pale.*	*Of Taste, bitter.*	*It provoketh the expulsive faculty of the guts, attenuates the Phlegm cleaving to them, but the Alimentary is fit to nourish the parts of like temper with it.*
Melancholy is	*Of Nature earthly, cold, and dry.*	*Of Consistence, grosse and muddy.*	*Of Colour, blackish.*	*Of Taste, acide, sour or biting.*	*Stirs up the Appetite, nourishes the Spleen, and all the parts of like temper to it, as the bones.*

Blood hath its neareſt matter from the better portion of the *Chylus*: and being begun to be laboured in the veins, at length gets form and perfection in the Liver; but it hath its remote matter from meats of good digestion and quality, seasonably eaten after moderate exercise; but for that, one age is better than another, and one time of the year more convenient than another. For blood is made more copiously in the Spring, because that season of the year comes neareſt to the temper of the blood, by reason of which the blood is rather to be thought temperate, than hot and moist; for that *Galen* makes the Spring temperate; and besides, at that time blood-letting is performed with the best success: Youth is an age very fit for the generation of blood; or by *Galens* opinion, rather that part of life that continues from the 25, to the 35 year of our age. Those in whom this Humor hath the dominion, are beautified with a fresh and rosie colour, gentle, and wel-natured, pleasant, merry, and facetious. The generation of Phlegm, is not by the imbecillity of heat, as some of the Ancients thought; who were perswaded that Choler was caused by a raging, Blood by a moderate, and Phlegm and Melancholy by a remiss heat. But that opinion is full of manifest error: for if it be true that the *Chylus* is laboured and made into blood in the same part, and by the same fire, that is, the Liver; from whence in the same moment of time should proceed that strong and weak heat, seeing the whole mass of the blood different in its four essentiall parts, is perfected and made at the same time, and by the same equall temper of the same part, action, and blood-making faculty; therefore from whence have

Lib. 1. de temp.

One and the same heat is the efficient cause of all humors at the same time.

have we this variety of Humors? From hence, for that those meats by which we are nourished, enjoy the like condition that our bodies do, from the four Elements, and the four first Qualities: for it is certain, and we may often observe, in what kind soever they be united or joined together, they retain a certain hot portion imitating the fire; another cold, the water; another dry, the earth; and lastly, another moist like to the air. Neither can you name any kind of nourishment, how cold soever it be, not Lettuce it self, in which there is not some fiery force of heat. Therefore it is no marvail, if one and the same heat working upon the same matter of *Chylus*, varying with so great dissimilitude of substances, do by its power produce so unlike humors, as from the hot, Choler; from the cold, Phlegm; and of the others, such as their affinity of temper will permit.

The heat of the Sun alone doth melt wax and harden clay.

There is no cause that any one should think that variety of humors to be caused in us, rather by the diversity of the active heat, than wax and a flint placed at the same time, and in the same situation of climat and soil, this to melt by the heat of the Sun, and that scarce to wax warm. Therefore that diversity of effects is not to be attributed to the force of the efficient cause, that is of heat, which is one, and of one kinde in all of us; but rather to the materiall cause, seeing it is composed of the conflux, or meeting together of various substances, gives the heat leave to work, as it were out of its store, which may make and produce from the hotter part therof Choler, and of the colder and more rebellious Phlegm. Yet I will not deny, but that more Phlegm, or Choler may be bred in one and the same body, according to the quicker, or slower provocation of the heat; yet nevertheless it is not consequent, that the originall of Choler should be from a more acide, and of Phlegm from a more dull heat in the same man. Every one of us naturally have a simple heat, and of one kind, which is the worker of divers operations, not of it self, seeing it is always the same, and like it self, but by the different fitness, pliableness, or resistance of the matter on which it works. Wherefore Phlegm is generated in the same moment of time, in the fire of the same part, by the efficiency of the same heat, with the rest of the blood, of the more cold, liquid, crude, and watery portion of the *Chylus*. Whereby it comes to pass, that it shews an express figure of a certain rude or unperfect blood, for which occasion nature hath made it no peculiar receptacle, but would have it to run friendly with the blood in the same passages of the veins, that any necessity hapning by famin, or indigency, and in defect of better nourishment, it may by a perfecter elaboration quickly assume the form of blood. Cold and rude nourishment make this humor to abound principally in winter, & in those which incline to old-age, by reason of the similitude which Phlegm hath with that season and age.

The divers condition of the matter alone, is the cause of variety.

The effect of Phlegm.

It makes a man drowsie, dul, fat, and swollen up, and hasteneth gray-hairs. Choler is as it were, a certain heat and fury of humors, which generated in the Liver, together with the blood is carried by the veins and arteries through the whole body. That of it which abounds, is sent, partly into the guts, and partly into the bladder of the gall, or is consumed by transpiration, or sweats; It is somewhat probable that the Arteriall blood is made more thin, hot, quick, and pallid, than the blood of the Veins, by the commixture of this Alimentary Choler. This Humor is chiefly bred and expel'd in youth, and acrid and bitter meats give matter to it: but great labours of body and mind give the occasion. It maketh a man nimble, quick, ready for all performance, lean, and quick to anger, and also to concoct meats. The melancholick humor, or Melancholy, being the grosser portion of the blood, is partly sent from the Liver to the Spleen to nourish it, and partly carried by the vessels into the rest of the body, and spent in the nourishment of the parts endued with an earthly drines; it is made of meats of gros juice, and by the perturbations of the mind, turned to fear and sadnes. It is augmented in Autumn, and in the first and crude Old-age; it makes men sad, harsh, constant, froward, envious and fearfull. All men ought to think, that such Humors are wont to move at set hours of the day, as by a certain peculiar motion or tide, Therefore the blood flows from the ninth hour of the night, to the third hour of the day; then Choler to the ninth of the day; then Melancholy to the third of the night; the rest of the night that remains, is under the dominion of Phlegm. Manifest examples hereof appears in the French-Pox. From the elaborat and absolute mass of the blood, (as we said before) two kinds of Humors, as excrements of the second concoction, are commonly and naturally separated, the one more gros, the other more thin. This is called either absolutely Choler, or with an adjunct, yellow Choler. That is called Melancholy, which drawn by the Spleen in a thinner portion, and elaborate by the heat of the Arteries, which in that part are both many and large, becomes nourishment to the part; the remnant thereof is carried by the veiny Vessel into the orifice of the ventricle, whereby it may not cause but whet the appetite, and by its astriction strengthen the actions thereof. But yellow Choler drawn into the bladder of the gall, remains there so long, till being troublesome, either in quantity or quality, it is excluded into the guts, whereby it may cast forth the excrements residing in them; the expulsive faculty being provoked by its acrimony, and by its bitterness kils the worms that are bred there. This same Humor is accustomed to die the urine of a yellow colour. There is another serous Humor; which truly is not fit to nourish but profitable for many other things, which is not an excrement of the second, but of the first concoction. Therefore nature would that mixed with the *Chylus*, it should come to

The effects of Choler.

The effects of Melancholy.

What motions are in each quarter of the body.

The Melancholy Humor doth not cause, but whet the appetite.

A serous or wheyish humor

the

the Liver, and not be voided with the excrements, whereby it might allay the groſneſs of the blood, and ſerve it for a vehicle; for otherwiſe the blood could ſcarce paſs through the capillary veins of the Liver, and paſſing the ſinous and gibbous parts thereof, come to the hollow vein. Part of this ſerous humor ſeparated together with the blood which ſerves for the nouriſhment of the Reins, and ſtraight carried into the bladder, is turned into that urine which we daily make; the other part therefore carryed through all the body together with the blood, performing the like duty of tranſportation, is excluded by ſweats into which it degenerates. Beſides the forenamed, the *Arabians* have mentioned four other humors, which they term Alimentary and ſecondary, as being the next matter of nouriſhment, as thoſe four the blood contains, the remote. They have given no name to the firſt kind, but imagin it to be that humor, which hangs ready to fall like to little drops in the utmoſt orifices of the veins. They call the ſecond kind, * Dew; being that humor, which entred already into the ſubſtance of the part, doth moiſten it. The third they call by a barbarous name, *Cambium*, which already put to the part to be nouriſhed, is there faſtned. The fourth named *Gluten*, or Glew, is only the proper and ſubſtance-making humidity of the ſimilar parts, not their ſubſtance. The diſtinction of the degrees of nutrition recited by *Galen* in his books of Naturall faculties, anſwer in proportion to this diſtinction of humors. The firſt is, that the blood flow to the part that requires nouriſhment; then that being there arrived, it may be agglutinated; then laſtly, that having loſt its former form of nouriſhment, it may be aſſimilated.

Secundary Humors.

* Ros.

Thoſe humors are againſt nature, which being corrupted, infect the body and the parts in which they are contained by the contagion of their corruption, retaining the names and titles of the humors, from whoſe perfection and nature they have revolted, they all grow hot by putrefaction, although they were formerly by their own nature cold. And they are corrupted, either in the veins only, or within and without the veins: In the veins Blood and Melancholy; but both without and within the veins, Choler and Phlegm. When Blood is corrupted in its thinner portion, it turns into Choler, when in its thicker, into Melancholy; for the Blood becomes faulty two manner of ways, either by the corruption of its proper ſubſtance by putrefaction, or by admixtion of another ſubſtance by infection. The Melancholy humor which is corrupted in the veins, is of three ſorts: The firſt is of a Melancholy juice putrefying, and by the force of a ſtrange heat, turned, as it were, into aſhes, by which it becomes aduſt, acrid and biting. The other ariſeth from that Choler which reſembles the yolks of eggs, which by aduſtion becomes leek-coloured, then æruginous, or of a blewiſh green, then red, and laſtly black, which is the very worſt kind of Melancholy, hot, malign, eating, and exulcerating, and which is never ſeen or voided with ſafety. The third comes from Phlegm putrefying in the veins, which firſt degenerates into ſalt Phlegm, but ſtraight by the ſtrength of extraneous heat degenerates into Melancholy.

Humors againſt nature.

Into what Humors the blood when it corrupts, doth degenerate.

The Melancholy Humor corrupted, is of three kinds.

Phlegm not naturall is bred, either

- In the Veins, and is either
  - Acide and very crude, as which hath had none or very little impreſſion of heat, but that which it firſt had in the ſtomach.
  - Salt, which is bred by the ſweet, putrefying and aduſt, or mixture of aduſt and ſalt particles.
- Or without the Veins, & is of four ſorts; either
  - Wateriſh, as is that thin moiſture which diſtils from the brain by the noſtrils.
  - Mucous, as when that wateriſh is thickned into filth by the help of ſome accidentall or ſmall heat.
  - Glaſſie, or * Albuminous, reſembling molten glaſs, or rather the white of an egg, and is moſt cold.
  - *Gypſea*, or Plaiſter-like, which is concrete into the hardneſs and form of chalk, as you may ſee in the joints of the fingers in a knotty gout, or in inveterate diſtillations upon the Lungs.

* *Albumina.*

Choler not naturall is bred, either

- In the Veins, as the * vitelline (like in conſiſtence to the yolk of a raw egg) which the acrimony of ſtrange heat breeds of yellow Choler, which ſame in diſeaſes altogether deadly, degenerates into green, æruginous, & laſtly into a blue, or colour like that which is dried by woad.
- Or in the capacity of the upper belly, as the ventricle, and this is of five kinds:
  - The firſt is called *Porracea*, or leek-coloured, reſembling the juice of a leek in greenneſs.
  - The ſecond *æruginoſa*, or æruginous, like in colour to verdigreaſe.
  - The third blewiſh, or woad-coloured, like the colour died by woad.
  - The fourth red, differing in this from blood, whoſe colour it imitates, that it never cometh into knots, or clods like blood.
  - The fifth very red, generated by the exceſs of the former, which cauſeth burning feavers.

* *Vitellina.*

The

The kinds of such Choler, are often cast forth by vomit in diseases, the strength of the disease being past; being troublesome to the parts through which they are evacuated, by their bitterness, acrimony, and biting.

The signes of a Sanguine person.

Such as the humor is, such is the colour.

The manners and diseases of Sanguine persons.

I Think it manifest, because the matter and generation of flesh is principally from blood, that a man of a fleshy, dense, and solid habit of body, and full of a sweet and vaporous juice, is of a Sanguine complexion. And the same party hath a flourishing and rosie colour in his face, tempered as with an equal mixture of white and red; of white, by reason of the skin lying utmost; of red, because of the blood spread underneath the skin: for always such as the humor is, such is the colour in the face. In manners, he is curteous, gentle, easie to be spoken to, not altogether estranged from the love of women, of a lovely countenance and smooth forehead, seldom angry, but taking all things in good part; for as the inclination of humors is, so also is the disposition of manners. But blood is thought the mildest of all humors; but the strong heat of the inward parts maketh him to eat and drink freely. Their dreams are pleasant, they are troubled with diseases arising from blood, as frequent Phlegmons, and many sanguine pustles breaking through the skin, much bleeding, and menstruous fluxes. Wherefore they can well endure blood-letting, and delight in the moderate use of cold and dry things; and lastly, are offended by hot and moist things. They have a great and strong Pulse, and much urine in quantity, but milde of quality, of an indifferent colour add substance.

The signes of a Cholerick person.

Cholerick are not commonly fat.

The manners and diseases of Cholerick persons.

CHolerick men are of a pale or yellowish colour, of a lean, slender and rough habit of body, with fair veins and large Arteries, and a strong and quick pulse: their skin being touched, feels hot, dry, hard, rough and harsh, with a pricking and acrid exhalation which breathes forth of their whole body. They cast forth much choler by stool, vomit and urine. They are of a quick and nimble wit, stout, hardy and sharp vindicators of received injuries, liberall even to prodigality, and somwhat too desirous of glory. Their sleep is light, and from which they are quickly waked; their dreams are fiery, burning, quick, and full of fury; they are delighted with meats and drinks which are somewhat more cold and moist, and are subject to Tertian and burning feavers, the Phrensie, Jaundise, Inflammations, and other Cholerick pustles, the Lask, Bloody flux, and bitterness of the mouth.

The signes of a Phlegmatick person.

The manners and diseases of phlegmatick persons.

THose in whom Phlegm hath the dominion, are of a whitish coloured face, and sometimes livid and swollen, with their body fat, soft, and cold to touch.

They are molested with Phlegmatick diseases, as Oedematous tumors, the Dropsie, Quotidian feavers, falling away of the hairs, and catarrhes falling down upon the Lungs, and the *Aspera Arteria*, or Weason: they are of a slow capacity, dull, slothfull, drowsie; they do dream of rains, snows, floods, swimming, and such like, that they often imagin themselves overwhelmed with waters; they vomit up much watery and Phlegmatick matter, or otherwise spit and evacuate it, and have a soft and moist tongue.

From whence noise or rumbling in the belly proceeds.

And they are troubled with a dog-like hunger, if at any time it should happen that their insipid Phlegm become acide; and they are slow of digestion, by reason of which they have great store of cold and Phlegmatick humors; which if they be carried down into the windings of the Colick-gut, they cause murmuring and noise, and sometimes the Colick.

For much wind is easily caused of such like Phlegmatick excrements wrought upon by a small and weak heat, such as Phlegmatick persons have, which by its naturall lightness is diversly carried through the turnings of the guts, and distends and swels them up, and whiles it strives for passage out, it causeth murmurings and noises in the belly, like wind breaking through narrow passages.

Signes of a Melancholick person.

Diseases familiar to Melancholy persons.

THe face of Melancholy persons is swart, their countenance cloudy and often cruell, their aspect is sad and froward; frequent Scirrhous, or hard swellings, tumors of the Spleen, Hæmorroids, *Varices* (or swollen Veins) Quartain feavers, whether continuall or intermitting; Quintain, Sextain, and Septimane feavers: and to conclude, all such wandering feavers or agues set upon them. But when it happens the Melancholy humor is sharpned, either by adustion, or commixture of Choler, then Tetters, the black Morphew, the Cancer simple and ulcerated, the Leprous and filthy scab, sending forth certain scaly and branlike excrescences, (being vulgarly called Saint *Manis* his evil;) and the Leprosie it self invades them: They have small veins and arteries, because coldness hath dominion over them; whose property is to straiten, as the quality of heat is to dilate. But if at any time their Veins seem big, that largeness is not by reason of the laudable

laudable blood contained in them, but from much windineſs; by occaſion whereof it is ſomewhat difficult to let them blood; not only, becauſe that when the Vein is opened, the blood flows ſlowly forth, by reaſon of the cold flowneſs of the humors; but much the rather, for that the vein doth not receive the impreſſion of the Lancet, ſliding this way and that way, by reaſon of the windineſs contained in it, and becauſe that the harſh drineſs of the upper skin, reſiſts the edg of the inſtrument. Their bodies ſeem cold and hard to the touch, and they are troubled with terrible dreams, for they are obſerved to ſeem to ſee in the night Devils, Serpents, dark dens and caves, ſepulchers, dead corpſes, and many other ſuch things full of horror, by reaſon of a black vapor, diverſly moving and diſturbing the brain, which alſo we ſee happens to thoſe, who * fear the water, by reaſon of the biting of a mad dog. You ſhall finde them froward, fraudulent, parſimonious, and covetous even to baſeneſs, ſlow ſpeakers, fearfull, ſad, complainers, carefull, ingenious, lovers of ſolitarineſs, man-haters, obſtinate maintainers of opinions once conceived, ſlow to anger, but angred not to be pacified. But when Melancholy hath exceeded natures and its own bounds, then by reaſon of putrefaction and inflammation all things appear full of extreme fury and madneſs; ſo that they often caſt themſelves headlong down from ſome high place, or are otherwiſe guilty of their own death, with fear of which notwithſtanding they are terrified.

From, or by what their Veins are ſwollen.

Their dreams.

* *Hydrophobi.*

Their manners.

But we muſt note that changes of the native temperament, do often happen in the courſe of a mans life, ſo that he which a while agone was Sanguine, may now be Cholerick, Melancholick, or Phlegmatick; not truly by the changing of the blood into ſuch Humors, but by the mutation of Diet, and the courſe or vocation of life. For none of a Sanguine complexion but will prove Cholerick if he eat hot and dry meats, (as all like things are cheriſhed and preſerved by the uſe of their like, and contraries are deſtroyed by their contraries) and weary his body by violent exerciſes, and continuall labors; and if there be a ſuppreſſion of Cholerick excrements, which before did freely flow, either by nature or art. But whoſoever feeds upon Meats generating groſs blood, as Beef, Veniſon, Hare, old Cheeſe, and all ſalt meats, he without all doubt ſliding from his nature, will fall into a Melancholy temper; eſpecially if to that manner of diet, he ſhall have a vocation full of cares, turmoils, miſeries, ſtrong and much ſtudy, carefull thoughts and fears; and alſo if he ſit much, wanting exerciſe, for ſo the inward heat, as it were, defrauded of its nouriſhment, faints, and grows dull, whereupon groſs and droſſie humors abound in the body. To this alſo the cold and dry condition of the place in which we live, doth conduce, and the ſuppreſſion of the Melancholy humor accuſtomed to be evacuated by the Hæmorrhoids, courſes, and ſtools.

From whence the change of the native temper.

How one may become Cholerick.

How Melancholick.

But he acquires a Phlegmatick temper, whoſoever uſeth cold and moiſt nouriſhment, much feeding, who before the former meat is gone out of the belly, ſhall ſtuff his paunch with more, who preſently after meat runs into violent exerciſes, who inhabit cold and moiſt places, who lead their life at eaſe in all idleneſs; and laſtly, who ſuffer a ſuppreſſion of the Phlegmatick humor accuſtomly evacuated by vomit, cough, or blowing the noſe, or any other way, either by nature or art. Certainly it is very convenient to know theſe things, that we may diſcern if any at the preſent be Phlegmatick, Melancholick, or of any other temper, whether he be ſuch by nature, or neceſſity. Having declared thoſe things which concern the nature of Temperaments, and deferred the deſcription of the parts of the body to our Anatomy, we will begin to ſpeak of the Faculties governing this our life, when firſt we ſhall have ſhewn by a practicall demonſtration of examples, the uſe and certainty of the aforeſaid rules of Temperaments.

How Phlegmatick.

CHAP. VII.

Of the Practice of the aforeſaid rules of Temperaments.

THat we may draw the Theorick of the Temperaments into practice, it hath ſeemed good for avoyding of confuſion which might make this our Introduction ſeem obſcure, if we would proſecute the differences of the Tempers of all men of all Nations, to take thoſe limits which Nature hath placed in the world; as South, North, Eaſt, and Weſt, and, as it were, the Center of thoſe bounds, that the deſcribed variety of Tempers, in colour, habit, manners, ſtudies, actions, and form of life of men that inhabit thoſe Regions ſituated ſo far diſtant one from another, may be as a ſure rule, by which we may certainly judg of every mans temperature in particular, as he ſhall appear to be nearer or further off from this or that Region. Thoſe which inhabit the South, as the *Africans*, *Æthiopians*, *Arabians*, and *Egyptians*, are for the moſt part deformed, lean, duskie coloured, and pale, with black eys and great lips, curled hair, and a ſmall and ſhrill voice. Thoſe which inhabit the Northern parts, as the *Scythians*, *Muſcovites*, *Polonians*, and *Germanes*, have their faces of colour white, mixed with a convenient quantity of blood, their skin ſoft and delicate, their hair long, hanging down

Four bounds or Regions of the world.

The forces of temperatures in particulars.

The temperature of the Southern people.

Of the Northern.

down and ſpreading abroad, and of a yellowiſh, or reddiſh colour; of ſtature they are commonly tall, and of a well proportioned, fat and compact habit of body, their eyes gray, their voice ſtrong, loud and big. But thoſe who are ſituated between theſe two former, as the *Italians* and *French*, have their faces ſomewhat ſwart, are well favoured, nimble, ſtrong, hairy, ſlender, well in fleſh, with their eyes reſembling the colour of Goats-eyes, and often hollow eyed, having a cleer, ſhrill and pleaſing voyce.

The Southern people prevail in wit, the Northern in ſtrength.

The Southern people are exceeded ſo much by the Northern in ſtrength and ability of body, as they ſurpaſs them in wit and faculties of the mind. Hence is it you may read in Hiſtories, that the *Scythians*, *Goths* and *Vandals* vexed *Africk* and *Spain* with infinite incurſions, and moſt large and famous Empires have been founded from the North to South; but few or none from the South to the North. Therefore the Northern people thinking all right and law to conſiſt in Arms, did by Duell only determine all cauſes and controverſies ariſing amongſt the Inhabitants, as we may gather by the ancient laws, and cuſtomes of the *Lombards*, *Engliſh*, *Burgonians*, *Danes* and *Germans*; and we may ſee in *Saxo* the *Grammarian* that ſuch a law was once made by *Fronto* King of *Denmark*. The which cuſtome at this day is every where in force amongſt the *Muskovites*. But the Southern people have alwayes much abhorred that faſhion, and have thought it more agreeable to Beaſts than Men. Wherefore we never heard of any ſuch thing uſed by the *Aſſyrians*, *Ægyptians*, *Perſians* or *Jews*. But moved by the goodneſs of their wit, they erected Kingdomes and Empires by the onely help of Learning and hidden ſciences. For ſeeing by nature they are Melancholik, by reaſon of the dryneſs of their temperature, they willingly addict themſelves to ſolitarineſs and contemplation, being endued with a ſingular ſharpneſs of wit. Wherefore the *Æthiopians*, *Egyptians*, *Africans*, *Jews*, *Phœnicians*, *Perſians*, *Aſſyrians*, and *Indians*, have invented many curious ſciences, revealed the Myſteries and ſecrets of Nature, digeſted the Mathematiques into order, obſerved the motions of the heavens, and firſt brought in the worſhip and religious ſacrifices of the gods: Even ſo far that the *Arabians* who live only by ſtealth, aud have only a Waggon for their houſe, do boaſt that they have many things diligently and accurately obſerved in Aſtrology by their Anceſtors, which every day made more accurate and copious, they, as by an hereditary right, commend to poſterity, as it is recorded by *Leo* the *African*. But the Northern people, as the *Germans*, by reaſon of the aboundance of humors and blood, by which the mind is as it were oppreſt, apply themſelves to works obvious to the ſenſes, and which may be done by the hand. For their minds oppreſt with the earhtly maſs of their bodies, are eaſily drawn from heaven and the contemplation of Celeſtiall things, to theſe inferior things, as to find out Mines by digging, to buy and caſt metalls, to draw and hammer out works of Iron, ſteel and braſs. In which things they have proved ſo excellent, that the glory of the Invention of Guns and Printing belongs to them.

The Southern people learned and religious.

The Northern famous Warriours, and Artificers.

The endowments of ſuch as inhabit between them.

The people who inhabit the middle regions between theſe, are neither naturally fit for the more abſtruſe ſciences, as the Southern people are, nor for Mechanick works, as the Northern, but intermeddle with civil affairs, commerce and Merchandizing. But are endued with ſuch ſtrength of body as may ſuffice to avoid and delude the crafts and arts of the Southern Inhabitants; and with ſuch wiſdom as may be ſufficient to reſtrain the fury and violence of the Northern. How true this is, any one may underſtand by the example of the *Carthaginians* and *Africans*, who when they had held *Italy* for ſome years by their ſubtile counſels, crafty ſleights and devices; yet could not eſcape, but at the length their Arts being deluded, and they ſpoiled of all their fortunes, were brought in ſubjection to the *Romans*. The *Gothes*, *Hunnes* and other Northern people have ſpoiled and overrun the *Romane* Empire by many incurſions and inroads, but deſtitute of counſell and providence, they could not keep thoſe things which they had gotten by Armes and valour. Therefore the opinion of all Hiſtorians is agreeing in this, that good laws, the form of governing a Common-wealth, all politick ordinances, the Arts of diſputing and ſpeaking, have had their beginnings from the *Greeks*, *Romans* and *French*. And from hence in times paſt and at this day a greater number of Writers, Lawyers and Counſellors of State have ſprung up, than in all the whole world beſides. Therefore that we may attribute their gifts to each Region, we affirm that, The Southern people are born and fit for the Studies of learning, the Northern for warres, and thoſe which be between them both for Empire and rule. The *Italian* is naturally wiſe, the *Spaniard* grave and conſtant; the *French* quick and diligent, for you would ſay hee runs when he goes, being compared to the ſlow and womaniſh pace of the *Spaniard*, which is the cauſe that *Spaniards* are delighted with *French* ſervants for their quick agility in diſpatching buſineſs. The Eaſtern people are ſpecially indued with a good, firm and well tempered wit, not keeping their counſels ſecret and hid. For the haſte is of the nature of the Sun, and that part of the day which is next to the riſing of the Sun is counted the right ſide and ſtronger; and verily in all things living the right ſide is alwayes the more ſtrong and vigorous. But the Weſtern people are more tender and effeminate, and more cloſe in their carriage and mind,

The Northern know how to overcome, but not how to uſe the victory.

The aboundance of counſellors and Lawyers from *France* and *Italy*.

The manners of the Eaſtern people.

not

not easily making any one partaker of their secrets. For the West is as it were subject to the Moon, because at the change it alwayes inclines to the West, whereby it happens, that it is reputed as nocturnall, sinister and opposite to the East; and the West is less temperate and wholsome. Therefore of the winds none is more wholsome than the East wind which blows from the West with a most fresh and healthfull gale, yet it seldome blows, and but only at Sun-set.

The East wind healthfull.

The Northern people are good eaters, but much better drinkers, witty when they are a little moistened with wine, and talkers of things both to be spoken and concealed, not very constant in their promises and agreements, but principal keepers and preservers of shamefastness and chastity, far different from the inhabitants of the South, who are wonderfull sparing, sober, secret and subtle, and much addicted to all sorts of wicked Lust. *Aristotle* in his Problemes saith that those nations are barbarous and cruell, both which are burnt with immoderate heat, and which are oppresst with excessive cold, because a soft temper of the Heavens, softens the manners and the mind. Wherefore both, as well the Northern, as Scythians and Germans; and the Southern, as Africans, are cruell; but these have this of a certain naturall stoutness, and souldierlike boldness, and rather of anger then a wilfull desire of revenge; because they cannot restrain by the power of reason the first violent motions of their anger by reason of the heat of their blood. But those of a certain inbred and inhumane pravity of manners, wilfully and willingly premeditating they perform the works of cruelty, because they are of a sad and melancholy nature. You may have an example of the Northern cruelty from the Transilvanians against their seditious Captain *George*, whom they gave to be torne in pieces alive and devoured by his Souldiers, (being kept fasting for three dayes before for that purpose) who was then unbowelled, and rosted, and so by them eaten up. The cruelty of *Hannibal* the Captain of the Carthaginians may suffice for an instance of the Southern cruelty. He left the Roman Captives wearied with burdens and the length of the way, with the soles of their feet cut off; But those he brought into his tents, joyning brethren and kinsmen together he caused to fight, neither was satisfied with blood before he brought all the victors to one man. Also we may see the cruell nature of the Southern Americans, who dip their children in the blood of their slain enemies, then suck their blood, and banquet with their broken and squeased Limbs.

The Northern people great eaters and drinkers.

Who are to be counted Barbarous.

The Northern and Southern have each their Cruelues.

Valer. Max. lib. 9. cap. 2.

And as the Inhabitants of the South are free from divers Plethorick diseases, which are caused by aboundance of blood, to which the Northern people are subject, as Feavers, Defluxions, Tumors, Madness with laughter which causeth those which have it to leap and dance, (the people commonly tearm it *S. vittus his evill*) which admits of no remedy but Musick: so they are often molested with the Frensie invading with madness and fury; by the heat whereof they are often so ravished and carried beside themselves that they foretell things to come; they are terrified with horrible dreams, and in their fits they speak in strange and forain tongues, but they are so subject to the scurfe and all kind of scabs and to the Leprosie as their homebred disease, that no houses are so frequently met withall by such as travell through either of the Mauritania's, as Hospitalls provided for the Lodging of Leapers.

The diseases of the Southern people.

Those who inhabit rough and Mountainous places, are more brutish, tough and able to indure labour: but such as dwell in Plains, especially if they be mooriſh, or fenniſh, are of a tender body, and sweat much with a little labour; the truth of which is confirmed by the Hollanders and Frizlanders. But if the Plain be such as is scorched by the heat of the Sun, and blown upon by much contrariety of winds, it breeds men who are turbulent, not to be tamed, desirous of sedition and novelty, stubborn, impatient of servitude, as may be perceived by the sole example of the Inhabitants of *Narbon* a province of *France*.

Mountainers.

Those who dwell in poor and barren places are commonly more witty and diligent and most patient of labours; the truth of which the famous wits of the *Athenians*, *Ligurians* and *Romans*, and the plain country of the *Bœotians* in *Greece*, of the *Campanians* in *Italy*, and of the rest of the Inhabiters adjoining to the *Ligurian* Sea, approves.

CHAP. VIII.

of the Faculties.

A Faculty is a certain power, and efficient cause, proceeding from the temperament of the part, and the performer of some actions of the body. There are three principall Faculties governing mans body as long as it enjoyes its integrity; the Animall, Vital and Natural. The Animall is seated in the proper temperament of the Brain, from whence it is distributed by the Nerves into all parts of the body wch have sense & motion. This is of three kinds, for one is Moving, another sensitive, the third principall. The sensitive consists in the five external senses, sight, hearing, taste, smel & touch. The moving principally remains in the Muscles & nerves as the fit instruments

What a faculty is.

3. Faculties.

of voluntary motion. The Principall comprehends the Reasoning faculty, the Memory and Fantasie. *Galen* would have the common or inward sense to be comprehended within the compass of the Fantasie, although *Aristotle* distinguish between them.

The Vitall abides in the Heart, from whence heat and life is distributed by the Arteries to the whole body: this is principally hindered in the diseases of the Brest; as the Principall is, when any disease assails the Brain; the prime action of the vitall faculty is Pulsation, and that continued agitation of the Heart and Arteries, which is of threefold use to the body: for by the dilatation of the Heart and Arteries the vitall spirit is cherished by the benefit of the Air which is drawn in; by the contraction thereof the vapours of it are purged and sent forth, and the native heat of the whole body is tempered by them both.

The triple use of the Pulse.

The naturall faculty is threefold.

The last is the Naturall faculty which hath chosen its principall seat in the Liver, it spreads or carries the nourishment over the whole body; but it is distinguished into 3. other faculties; The Generative, which serves for the generation and forming of the Issue in the wombe; the Growing or increasing faculty, which flourisheth from the time the Issue is formed, untill the perfect growth of the solid parts into their full dimensions of length, height and bredth. The nourishing faculty, which as servant to both the other repairs and repays the continuall efflux, and waste of the threefold substance; for Nutrition is nothing else but a replenishing, or repairing whatsoever is wasted or emptied. This nourishing faculty endures from that time the Infant is formed in the wombe untill the end of life. It is a matter of great consequence in Physick to know the 4. other faculties, which as servants attend upon the nourishing faculty; which are the Attractive, Retentive, Digestive, and Expulsive faculty. The Attractive draws that juyce which is fit to nourish the body, that I say which by application may be assimilated to the part. This is that faculty which in such as are hungry draws down the meat scarce chewed, and the drink scarse tasted, into the gnawing and empty stomack. The Retentive faculty is that which retains the nourishment once attracted untill it be fully laboured and perfectly concocted; And by that means it yeelds no small assistance to the Digestive faculty. For the naturall heat cannot perform the office of concoction, unless the meat be embraced by the part, and make some stay therein. For otherwise the meat carryed into the stomach never acquires the form of *Chylus*, unless it stay detained in the wrinkles thereof, as in a rough passage, untill the time of *Chylification*. The Digestive facultie assimilates the nourishment, being attracted and detained, into the substance of that part whose faculty it is, by the force of the inbred heat and proper disposition or temper of the part. So the stomach plainly changes all things which are eat and drunk into *Chylus*, and the Liver turns the *Chylus* into blood. But the Bones and Nerves convert the red and liquid blood which is brought down unto them by the capillary or small veins, into a white and solid substance. Such concoction is far more laborious in a Bone and Nerve, than in the Musculous flesh. For the blood being not much different from its nature, by a light change and concretion turns into flesh. But this Concoction will never satisfie the desire of Nature and the parts, unless the nourishment purged from its excrements, put away the filth and dross, which must never enter into the substance of the part. Wherefore there do not only two sorts of excrements remain of the first and second Concoction, the one thick, the other thin, as we have said before; but also from the third Concoction which is performed in every part. The one of which we conceive only by reason, being that which vanisheth into Air by insensible transpiration. The other is known sometimes by sweats, sometimes by a thick fatty substance staining the shirt; sometimes by the generation of hairs and nails, whose matter is from fuliginous and earthly excrements of the third Concoction. Wherefore the fourth faculty was necessary which might yeeld no small help to nourishment; it is called the Expulsive, appointed to expell those superfluous excrements which by no action of heat, can obtain the form of the part. Such faculties serving for nutrition are in some parts two-fold; as some common, the benefit of which redounds to the whole body, as in the ventricle, liver and veins; Others only attending the service of those parts in which they remain, and in some parts all these 4. alwell common as proper, are abiding and residing as in those parts we now mentioned: some with the 4. proper have only two common, as the Gall, Spleen, Kidnies and Bladder. Others are content only with the proper, as the similar and Musculous parts, who if they want any of these 4. faculties, their health is decayed either by want of nourishment, and ulcer, or otherwise. The like unnaturall affects happen by the deficiency of just aud laudable nourishment. But if it happen those faculties do rightly perform their duty, the nourishment is changed into the proper part, and is truly assimilated as by these degrees. First it must flow to the part, then be joyned to it, then agglutinated, and lastly as we have said, assimilated. Now we must speak of the Actions which arise from the faculties.

What Nutrition is.

Four other faculties attend upon the nourishing faculty.

The necessity of the retentive faculty.

Two excrements of every concoction.

The work of the expulsive faculty.

By what degrees the nourishment is assimilated.

CHAP.

CHAP. IX.

of the Actions.

What an Action is.

AN Action or Function is an active motion proceeding from a faculty; for as the faculty depends on the Temperament, so the Action on the faculty, and the Act or work depends upon the Action by a certain order of consequence. But although that the words Action and Act or work are often confounded, yet there is this difference between them, as that the Action signifies the motion used in the performance of any thing; but the Act or work, the thing already done and performed: for example, Nutrition and the Generating of flesh are naturall Actions; but the parts nourished, and a hallow ulcer filled with flesh are the works of that motion, or action. Wherefore the Act ariseth from the Action, as the Action ariseth from the faculty, the integrity or perfection of the instruments concurring in both. For as, if the faculty be either defective, or hurt, no Action will be well performed: so unless the Instruments keep their native and due conformity (which is their perfect health, the operator of the Action proper to the instrument) none of those things, which ought to be, will be well performed. Therefore for the performance of blameless and perfect actions, it is fit a due conformity of the instrument concur with the faculty.

An action and and Act are different.

But Actions are two fold; for they are either Naturall, or Voluntary. They are tearmed Naturall, because they are performed not by our will, but by their own accord and against our will: As are, that continuall motion of the Heart, the beating of the Arteries, the expulsion of the Excrements, and such other like which are done in us by the Law of Nature whether we will, or no. These Actions flow either from the Liver and veins, or from the Heart and Arteries. Wherefore we may comprehend them under the names of Naturall and Vitall Actions. For we must attribute his Action to each faculty, lest we may seem to constitute an idle faculty, and no way profitable for use. The unvoluntary vitall actions, are the dilatation and contraction of the Heart and Arteries, the which we comprehend under the sole name of the Pulse: by that they draw in, and by this they expell, or drive forth. The unvoluntary vitall actions be,

Naturall actions.

Generation, Growth and Nutrition } which proceed from the { Generative, Growing, and Nouriſhing } facultie.

Generation is nothing else then a certain producing or acquiring of matter, and an introducing of a substantiall form into that matter; this is performed by the assistance of two faculties; of the Altering, which doth diversly prepare and dispose the seed and menstruous blood to put on the form of a Bone, nerve, spleen, flesh and such like: of the Forming faculty, which adorns with figure, site, and composition, the matter ordered by so various a preparation.

What Growth is.

Growth is an inlarging of the solid parts into all the dimensions, the pristine and ancient form remaining safe and sound in figure and solidity. For the perfection of every growth is judged only by the solid parts; for if the body swell into a mass of flesh, or fat, it shall not therefore be said to be grown: but then only when the solid parts do in like manner increase, especially the bones, because the growth of the whole body follows their increase, even although at the same time it wax lean and pine away.

What Nutrition is.

Nutrition is a perfect assimilation of that nouriſhment which is digested, into the nature of the part which digests. It is performed by the assistance of 4. subsidiary or helping actions, Attractive, Retentive, Digestive, and Expulsive.

Action voluntary.

The voluntary actions which we willingly perform, are so called, because we can at our pleasure hinder, stir up, slow or quicken them. They are three in generall, the sensitive, moving, and principall Action. The sensitive * Soul comprehends all things in five senses, in Sight, Hearing, Smell, Taste and Touch. Three things must necessarily concur to the performance of them, the Organ, the *Medium* or mean, and the Object. The principall Organ, or Instrument, is the Animall spirit diffused by the nerves into each several part of the body, by which such actions are performed. Wherefore for the present we will use the Parts themselves for their Organs. The Mean is a Body, which carryes the Object to the Instrument. The Object is a certain externall quality, which hath power by a fit *Medium* or Mean to stir up and alter the Organ. This will be more manifest by relating the particular functions of the senses by the necessary concurring of these three.

* *Anima sentiens.*

How sight is performed.

Sight, is an action of the seeing faculty, which is done by the Eye, fitly composed of its coats and humors, and so consequently the Organicall body of this Action. The Object is a visible quality brought to the Eye. But such an Object is twofold; for either it is absolutely visible of its self, and by its own Nature, as the Sun, the fire, the Moon and Stars: or desires as it were the help of another that it may be actually such, for so by the coming of the light colours, which were visible in power onely, being brought to the Eye, they do seem and appear such as they actually are.

But such Objects cannot arrive at the Eye, but through a clear and illuminate *Medium*, as the Air, Water, Glasse and all sorts of Crystall.

How hearing. The Hearing hath for its Organ the Ear and Auditory passage, which goes to the stony bone furnished with a Membrane investing it, an Auditory Nerve, and a certain inward spirit there contained. The Object is every sound arising from the smitten or broken Air, and the Collision of two bodies meeting together. The *Medium* is the encompassing Air which carries the sound to the Ear.

How smelling. Smelling (according to *Galens* opinion) is performed in the Mamillary processes produced from the proper substance of the brain, and seated in the upper part of the nose: although others had rather smelling should be made in the very foremost ventricles of the brain. This Action is weak in man in comparison of other Creatures: the Object thereof is every smell, or fumid exhalation breathing out of bodies. The *Medium* by which the Object is carried to the noses of Men, Beasts and Birds, is the Air, but to Fishes the Water it self.

How the taste. The Action of taste is performed by the tongue being tempered well and according to nature, and furnished with a nerve spred over its upper part from the third and fourth conjugation of the brain. The Object is * Taste, of whose nature and kinds we will treat more at large in our Antidotary. The *Medium* by the which the Object is so carried to the Organ, that it may affect it, is either externall or internall: The externall is that spattle which doth as it were anoint and supple the tongue; the interyall is the spongy flesh of the tongue it self, which affected with the quality of the Object doth presently so possess the nerve that is implanted in it, that the kind and quality thereof by the force of the spirit may be carryed into the common sense.

* *Sapor.*

How touching. All parts endued with a nerve enjoy the sense of touching, which is chiefly done, when a tractable quality doth penetrate even to the true and nervous skin, which lyeth under the Cuticle, or scarf-skin; we have formerly noted, that it is most exquisite in the skin which invests the ends of the fingers. The Object is every tractable quality, whether it be of the first rank of qualities, as Heat, Cold, Moisture, Dryness, or of the second, as Roughness, Smoothness, Heaviness, Lightness, Hardness, Softness, Rarity, Density, Friability, Unctuosity, Grosness, Thinness. The *Medium* by whose procurement the instrument is affected, is either the skin or the flesh interwoven with many Nerves.

Of motion. The next Action, is that Motion, which by a peculiar name we call voluntary; this is performed and accomplished by a Muscle, being the proper Instrument of voluntary Motion. Furthermore every motion of a member possessing a Muscle is made either by bending and contraction, or by extention. Although generally there be so many differences of voluntary motion, as there are kinds of site in place; therefore Motion is said to be made upward, downward, to the right hand, to the left, forward and backward; Hither are referred the many kinds of motions, which the infinite variety of Muscles produce in the body.

How respiration may be a voluntary motion. Into this rank of Voluntary Actions, comes Respiration, or breathing, because it is done by the help of the Muscles; although it be chiefly to temper the heat of the Heart. For we can make it more quick, or slow as we please, which are the conditions of a voluntary Motion.

Lastly, that we may have somewhat in which we may safely rest and defend our selves against the many questions which are commonly moved concerning this thing, wee must hold, that Respiration is undergone and performed by the Animall faculty, but chiefly instituted for the vitall.

The third principall Action. The principall Action and prime amongst the Voluntary is absolutely divided in three, Imagination, Reasoning and Memory.

Imagination is a certain expressing, and apprehension which discerns and distinguisheth between the forms and shapes of things sensible, or which are known by the senses.

Reasoning is a certain judiciall estimation of conceived or apprehended forms or figures, by a mutuall collating or comparing them together.

Memory is the sure storer of all things, and as it were the Treasury which the mind often unfolds and opens, the other faculties of the mind being idle and not imployed. But because all the forementioned Actions whether they be Naturall, or Animall and voluntary, are done and performed by the help and assistance of the Spirits; therefore now we must speak of the Spirits.

CHAP. X.

Of the Spirits.

What a spirit is. THe Spirit is a subtile and aery substance, raised from the purer blood that it might be a vehicle for the faculties (by whose power the whole body is governed) to all the parts, and the prime instrument for the performance of their office. For they being destitute of its sweet approach doe presently cease from action, and as dead do rest from their accustomed labours. From hence it

is

is that making a variety of Spirits according to the number of the faculties, they have divided them into three; as one Animall, another Vitall, another Naturall. Spirits threefold.

The Animall hath taken his seat in the brain; for there it is prepared and made, that from thence conveyed by the Nerves, it may impart the power of sense and motion to all the rest of the members. An argument hereof is, that in the great cold of Winter, whether by the intercepting them in their way, or by the concretion, or, as it were, freezing of those spirits the joynts grow stiff, the hands numb, and all the other parts are dull, destitute of their accustomed agility of motion, and quickness of sense. It is called Animall, not because it is the * Life, but the chief and prime instrument thereof: wherefore it hath a most subtil and aery substance; and enjoys divers names, according to the various condition of the Sensories or seats of the senses into which it enters; for that which causeth the sight, is named the Visive: you may see this by night, rubbing your eys, as sparkling like fire. That which is conveyed to the Auditory passage, is called the Auditive or Hearing: That which is carried to the instruments of Touching, is termed the Tactive; and so of the rest. The Animall spirit. Why so called. * *Anima.*

This Animall spirit is made and laboured in the windings and foldings of the Veins and Arteries of the brain, of an exquisit subtil portion of the vitall brought thither by the *Carotide Arteriæ*, or sleepy Arteries; and sometimes also of the pure air, or sweet vapour drawn in by the Nose in breathing. Hence it is, that with Ligatures we stop the passage of this spirit, from the parts we intend to cut off. An Humor which obstructs or stops its passage, doth the like in Apoplexies and Palsies, whereby it happens that the members situate under that place do languish and seem dead, sometimes destitute of motion, sometimes wanting both sense and motion. How it is made;

The Vitall spirit is next to it in dignity and excellency, which hath its chief mansion in the left ventricle of the Heart, from whence, through the Channels of the Arteries, it flows into the whole body, to nourish the heat which resides fixed in the substance of each part, which would perish in short time, unless it should be refreshed by heat flowing thither together with the spirit. And because it is the most subtil next to the Animall, Nature (lest it should vanish away) would have it contained in the Nervous coat of an Artery, which is five times more thick than the coat of the Veins, as *Galen*, out of *Herophilus*, hath recorded. The Vitall spirit.

It is furnished with matter from the subtil exhalation of the blood, and that air which we draw in breathing. Wherefore it doth easily and quickly perish by immoderate dissipations of the spirituous substance, and great evacuations; so it is easily corrupted by the putrefaction of Humors, or breathing in of pestilent air and filthy vapours; which thing is the cause of the so suddain death of those which are infected with the Plague. This spirit is often hindred from entring into some part, by reason of obstruction, fulness, or great inflammations; whereby it follows, that in a short space, by reason of the decay of the fixed and inbred heat, the parts do easily fall into a Gangrene, and become mortified. What the matter of it is.

The Naturall spirit (if such there be any) hath its station in the liver and Veins. It is more gross and dull than the other, and inferior to them in the dignity of the Action, and the excellency of the use. The use thereof is to help the concoction both of the whole body, as also of each severall part, and to carry blood and heat to them. There is some doubt of the Naturall spirit.

Besides those already mentioned, there are other Spirits fixed and implanted in the similar and prime parts of the body, which also are naturall, and Natives of the same place in which they are seated and placed. And because they are also of an aery and fiery nature, they are so joined or rather united to the Native heat, that they can no more be separated from it than flame from heat; wherefore they with these that flow to them, are the principall instruments of the Actions which are performed in each severall part; And these fixed Spirits have their nourishment and maintenance from the radicall and first-bred moisture, which is of an aery and oily substance, and is, as it were, the foundation of these Spirits, and the inbred heat. Therefore without this moisture, no man can live a moment. But also the chief Instruments of life are these Spirits, together with the Native heat. Wherefore this radicall Moisture being dissipated and wasted, (which is the seat, fodder, and nourishment of the Spirits and heat) how can they any longer subsist and remain? Therefore the consumption of the naturall heat, followeth the decay of this sweet and substance-making moisture, and consequently death, which happens by the dissipating and resolving of naturall heat. Fixed Spirits. The radicall Moisture. Naturall death.

But since then these kind of Spirits with the naturall heat, is contained in the substance of each similar part of our body, (for otherwise it could not persist) it must necessarily follow, that there be as many kinds of fixed Spirits, as of similar parts. For because each part hath its proper temper and encrease, it hath also its proper Spirit, and also its own proper fixed and implanted heat, which here hath its abode, as well as its Originall. Wherefore the Spirit and heat which is seated in the bone, is different from that which is impact into the substance of a Nerve, Vein, or such other similar part; because the temper of these parts is different, as also the mixture of the Elements from which they first arose and sprung up. Neither is this contemplation of Spirits of small account, for in these consist all the force and efficacy of our Nature.

These

The use and necessity of the Spirits.

These being by any chance dissipated or wasted, we languish; neither is any health to be hoped for, the flour of life withering and decaying by little and little. Which thing ought to make us more diligent, to defend them against the continuall efflux of the threefold substance. For if they be decayed, there is left no proper indication of curing the disease; so that we are often constrained, all other care laid aside, to betake our selves to the restoring and repairing the decayed powers. Which is done by meats of good juice, easie to be concocted and distributed; good Wines, and fragrant smels.

What the remedy for the dissipation of the Spirits. What the remedy for oppression of the Spirits is.

But sometimes these Spirits are not dissipated, but driven in and returned to their fountains, and so both oppress and are oppress; whereupon it happens we are often forced to dilate and spread them abroad by binding and rubbing the parts. Hitherto we have spoke of these things which are called Naturall, because we naturally consist of them; it remains that we now say somewhat of their Adjuncts and Associates by familiarity of Condition.

The Adjuncts and Associates to things Naturall: are,
- *Age*: of which, by reason of the similitude of the Argument, we were constrained to speak, when we handled the Temperatures.
- *Sex*.
- *Colour*: of which we have already spoken.
- The conformation of the *Instrumentall* parts.
- *Time*: whose force we have also considered.
- *Region*.
- Order of *Diet*, and condition of *Life*.

CHAP. XI.

Of the Adjuncts of things Naturall.

What sex is.

The nature of women.

SEX is no other thing than the distinction of Male and Female; in which this is most observable, that for the parts of the body, and the site of these parts, there is little difference between them; but the Female is colder than the Male. Wherefore their spermaticall parts are more cold, soft, and moist; and all their naturall actions less vigorous and more depraved.

Of Eunuchs.

The Nature of Eunuchs is to be referred to that of women, as who may seem to have degenerated into a womanish nature, by deficiency of heat; their smooth body, and soft and shrill voice do very much assimilate women. Notwithstanding you must consider, that there be some Manly women, which their manly voice, and chin covered with a little hairiness, do argue: and on the contrary, there are some womanizing, or womanish men, which therefore we term dainty and effeminate.

Of Hermaphrodites.

The Hermaphrodite is of a doubtfull nature, and in the middle of both sexes seems to participate of both Male and Female.

Colour the bewrayer of the Temperament.

The Colour which is predominant in the habit and superficies of the body, and lyes next under the skin, shews the Temperament of what kind soever it be; for as *Galen* notes *in Comment. ad Aphor. 2. sect. 1.* Such a colour appears in us, as the contained Humor hath. Wherefore if a rosie hew colour the cheeks, it is a sign the body abounds with blood, and that it is carried abroad by the plenty of Spirits. But if the skin be dyed with a yellow colour, it argues Choler is predominant; if with a whitish and pallid hue, Phlegm; with a sable and duskie, Melancholy. So the colour of the Excrements which are according to Nature, is not of the least consideration. For thus, if an Ulcer being broken send forth white matter, it argues the soundness of the part from whence it flows; but if sanious or bloody, green, blackish, or of divers colours, it shews the weakness of the solid part, which could not assimilate by concoction the colour of the excrementitious humor. The like reason is of unnaturall Tumors: For, as the colour, so the dominion of the Humor causing or accompanying the swelling commonly is.

The perfection of the organicall parts, consists in four things.

The conformity and integrity of the Organicall parts is considered by their figure, greatness, number, situation, and mutuall connexion. We consider the figure, when we say, almost all the externall parts of the body are naturally round, not only for shew, but for necessity, that being smooth and no way cornered, they should be less obnoxious to externall injuries; we speak of Greatness, when we say, some are large and thick, some lank and lean. But we consider their Number, when we observe some parts to abound, some to want, or nothing to be defective or wanting. We insinuate Site and Connexion, when we search, whether every thing be in its proper place, and whether they be decently fitted, and well joined together.

We have handled the varieties of the four seasons of the Year, when we treated of Temperaments. But the consideration of Region (because it hath the same judgment that the Air) shall be referred to that disquisition or enquiry which we intend to make of the Air, amongst the things not naturall.

The

The manner of life, and order of Diet are to be diligently observed by us, because they have great power either to alter, or preserve the Temperament. But because they are of almost infinite variety, therefore they scarce seem possible to fall into Art, which may prosecute all the differences of Diet and Vocations of life. Wherefore if the Calling of Life be laborious, as that of Husbandmen, Mariners, and other such trades, it strengthens and dries the parts of the body. Although those which labour much about Waters, are most commonly troubled with cold and moist diseases, although they almost kill themselves with labour. Diet.

Again, those which deal with Metals, as all sorts of Smiths, and those which cast and work brass, are more troubled with hot diseases, as Feavers. But if their Calling be such, as they sit much, and work all the day long sitting at home, as shoomakers; it makes the body tender, the flesh effeminate, and causeth great quantity of excrements. A life as well idle and negligent in body, as quiet in mind, in all riotousness and excesses of Diet, doth the same. For from hence the body is made subject to the Stone, Gravel, and Gout.

That calling of life which is performed with moderate labour, clothing, and diet, seems very fit and convenient to preserve the naturall temper of the body. The ingenious Chirurgeon may frame more of himself that may more particularly conduce to the examination of these things. Therefore the things naturall, and those which are near or neighbouring to them being thus briefly declared; the Order seems to require, that we make enquiry of things not Naturall. The commodities of an indifferent Diet.

CHAP. XII.

Of things not Naturall.

THe things which we must now treat of, have by the later Physitians been termed Not-naturall; because they are not of the number of those which enter into the constitution or composure of mans body; as the Elements, Humors, and all such things which we formerly comprehended under the name of Natural: although they be such as are necessary to preserve and defend the body already made and composed. Wherefore they were called by *Galen* Preservers; because by the due use of them the body is preserved in health. Also, they may be called Doubtfull, and Neuters, for that rightly and fitly used, they keep the body healthfull, but inconsiderately, they cause diseases. Whereby it comes to pass, that they may be thought to pertain to that part of Physick which is of preserving health; not because some of these things should be absolutely and of their own nature wholsom, and others unwholsom; but only by this, that they are, or prove so by their convenient, or prepostrous use. Therefore we consider the use of such like things from four conditions, Quantity, Quality, Occasion, and Manner of using: If thou shalt observe these, thou shalt attain and effect this, That those things which are of themselves, are, as it were, doubtfull, shall bring certain and undoubted health. For these four Circumstances do so far extend, that in them, as in the perfection of Art, the Rules which may be prescribed to preserve health are contained. But *Galen* in another place, hath in four words comprehended these things not Naturall; as, things Taken, Applyed, Expelled, and to be Done. Things Taken, are those which are put into the body, either by the mouth, or any other way; as the air, meat and drink. Things Applyed, are those which must touch the body, as the Air now mentioned, affecting the body with a diverse touch of its qualities of heat, cold, moisture, or driness. Expelled, are what things soever being unprofitable are generated in the body, and require to be expelled. To be Done, are labour, rest, sleep, watching, and the like. We may more distinctly, and by expression of proper Names, revoke all these things to fix: Why they are called things not naturall. *Galen* 1. ad Glauconem. *Lib. de sanitat. tuend.*

Which are
- *Air.*
- *Meat* and *Drink.*
- *Labor* and *Rest.*
- *Sleep* and *Watching.*
- *Repletion* and *Inanition*; or things to be expelled, or retained and kept.
- *Perturbations* of the Minde.

CHAP. XIII.

Of the Air.

How neceſſary for life the Air is.

AIR is ſo neceſſary to life, that we cannot live a moment without it; if ſo be that breathing, and much more tranſpiration, be not to be ſeparated from life. Wherefore it much conduceth to know, what Air is wholſom, what unwholſom, and which by contrariety of qualities fights for the Patient againſt the diſeaſe; or on the contrary by a ſimilitude of qualities ſhall nourith the diſeaſe, that if it may ſeem to burden the Patient by increaſing or adding to the diſeaſe, we may correct it by Art. So in curing the wounds of the head, eſpecially in winter, we labour by all the means we may to make the air warm. For cold is hurtfull to the Brain, Bones, and the wounds of theſe parts; and heat is comfortable and friendly. But alſo the Air being drawn into the body by breathing when it is hotter than ordinary, doth with a new warmth over-heat the heart, lungs, and ſpirits, and weaken the ſtrength by the diſſipation of the Spirits too much attenuated; ſo being too cold, in like manner the ſtrength of the faculties faints and grows dull, either by ſuppreſſion of the vapors, or by the inſpiſſation or thickning of the Spirits.

What Air is hurtfull.

Therefore to conclude, that Air is to be eſteemed healthfull, which is clear, ſubtil, and pure, free and open on every ſide, and which is far remote from all carion-like ſmels of dead carkaſſes, or the ſtench of any putrefying thing whatſoever: the which is far diſtant from ſtanding pools, and fens, and caves, ſending forth ſtrong and ill vapors; neither too cloudy nor moiſt by the nearneſs of ſome river.

Such an Air, I ſay, if it have a vernall temper, is good againſt all diſeaſes. That Air which is contrary to this, is altogether unhealthfull; as that which is putrid, ſhut up, and preſt by the ſtraitneſs of neighbouring Mountains, infected with ſome noiſom vapor. And becauſe I cannot proſecute all the conditions of Airs, fit for the expelling of all diſeaſes, as which are almoſt infinite; it ſhall ſuffice here to have ſet down, what we muſt underſtand by this word *Air*.

Three things are underſtood by the name of the Air.

Phyſitians commonly uſe to underſtand three things by the name of *Air*; The preſent ſtate of the Air; the Region in which we live; and the ſeaſon of the Year. We ſpoke of this laſt, when we treated of Temperaments. Wherefore we will now ſpeak of the two former. The preſent ſtate of the Air, one while for ſome ſmall time, is like the Spring, that is, temperate; otherwhiles like the Summer, that is, hot and dry; otherwhiles like the Winter, that is, cold and moiſt; and ſometimes like the Autumn, which is unequall; and this laſt conſtitution of the Air is the cauſe of many diſeaſes. When upon the ſame day, it is one while hot, another cold, we muſt expect Autumnall diſeaſes. Theſe tempers and varieties of conſtitutions of the Air, are chiefly and principally ſtirred up by the winds; as which being diffuſed over all the Air, ſhew no ſmall force by their ſodain change. Wherefore we will briefly touch their natures: That which blows from the Eaſt, is called the Eaſt-wind, and is of a hot and dry nature, and therefore healthfull. But the Weſtern-wind is cold and moiſt, and therefore ſickly. The South-wind is hot and moiſt, the Author of putrefaction and putrid diſeaſes. The North-wind is cold and dry, therefore healthy: wherefore it is thought, if it happen to blow in the Dog-days, that it makes the whole year healthfull, and purges and takes away the ſeeds of putrefaction, if any chance to be in the Air. But this deſcription of the four Winds, is then only thought to be true, if we conſider the Winds in their own proper nature, which they borrow from theſe Regions from which they firſt proceed. For otherwiſe they affect the Air quite contrary, according to the diſpoſition of the places over which they came; as Snowie places, Seas, Lakes, Rivers, Woods, or ſandy Plains, from whence they may borrow new qualities, with which they may afterwards poſſeſs the Air, and ſo conſequently our bodies.

Aphor. 4. ſect. 2. The force of the Winds.

How the winds acquire other faculties, than they naturally have.

The Weſtwind of it ſelf unwholſom.

Hence it is we have noted the Weſtern-wind unwholſom, and breeding diſeaſes, by reaſon of the proper condition of the Region from whence it came; and ſuch, that is cold and moiſt; the *Gaſcoins* find it truly to their ſo great harm, that it ſeldom blows with them, but it brings ſome manifeſt and great harm, either to their bodies, or fruits of the earth. And yet the *Greeks* and *Latins* are wont to commend it for healthfulneſs, more than the reſt. But alſo the riſing and ſetting of ſome more eminent ſtars, do often cauſe ſuch cold winds, that the whole Air is cooled, or infected with ſome other malign quality. For vapors and exhalations are often raiſed by the force of the Stars, from whence winds, clouds, ſtorms, whirlwinds, lightnings, thunders, hail, ſnow, rain, earthquakes, inundations, and violent raging of the ſea, have their originall. The exact contemplation of which things, although it be proper to Aſtronomers, Coſmographers, and Geographers, yet *Hippocrates* could not omit it, but that he muſt ſpeak ſomething in his book *De Aëre & Aquis*; where he touches by the way, the deſcription of the neighbouring Regions, and ſuch as he knew.

What force ſtars have upon the Air.

From this force of the Air, either hurtfull, or helping in diſeaſes, came that famous obſerva-

obſervation of *Guido* of *Caulus*; That wounds of the head are more difficult to cure at *Paris*, than at *Avignion*, and the plain contrary of wounds of the legs; for the air of *Paris*, compared to that of *Avignion*, is cold and moiſt, wherefore hurtfull and offenſive to the wounds of the head. On the contrary, the ſame air, becauſe it obſcures the ſpirits, incraſſates the blood, condenſates the humors, and makes them leſs fit for defluxions, makes the wounds of the legs more eaſie to be healed, by reaſon it hinders the courſe of the humors, by whoſe defluxion the cure is hindred. But it is manifeſt, that hot and dry places make a greater diſſipation of the naturall heat, from whence the weakneſs of the powers; by which ſame reaſon, the Inhabitants of ſuch places do not ſo well endure blood-letting; but more eaſily ſuffer purgations, though vehement, by reaſon of the contumacie of the humor, cauſed by drineſs. To conclude, the Air changes the conſtitutions of our bodies, either by its qualities, as if it be hotter, colder, moiſter, or drier; or by its matter, as if it be groſſer, or more ſubtil than is fit, or corrupted by exhalations from the earth, or by a ſodain and unaccuſtomed alteration, which any man may prove, who makes a ſodain change out of a quiet air into a ſtormy and troubled with many winds. But becauſe, next to the Air, nothing is ſo neceſſary to nouriſh mans body, as Meat and Drink, I will now begin to ſpeak of them both.

How the air of *Paris* comes to be ill for wounds of the head, and good for thoſe of the leggs.

By what means the air changes our bodies.

CHAP. XIIII.

Of Meat and Drink.

THat this our Treatiſe of meat and drink may be more brief and plain, I have thought good to part it into theſe heads, as to conſider the goodneſs and ilneſs of both of them, their quantity, quality, cuſtom, delight, order, time, and to accommodate them all to the ages and ſeaſons of the year. We judge of the goodneſs and pravity of meats and drinks, from the condition of the good or vicious humours, or juice which they beget in us. For evill juice cauſeth many diſeaſes. As on the contrary, good juice drives away all diſeaſes from the body, except the fault happen from ſome other occaſion, as from quantity, or too much exceſs. Wherefore it is principally neceſſary, that thoſe who will preſerve their preſent health, and hinder the acceſs of diſeaſes, feed upon things of good nouriſhment and digeſtion, as are good wine, the yolks of egs, good milk, wheaten bread well baked, the fleſh of Capons, Partridge, Thruſhes, Larks, Veal, Mutton, Kid, and ſuch like other, which you may find mentioned in the Books which *Galen* writ, *De Alimentorum facultatibus*; where alſo he examins thoſe which are of evill juice by their manifeſt qualities, as acrimony, bitterneſs, ſaltneſs, acidity, harſhneſs, and ſuch like.

The goodneſs of nouriſhments.

But unleſs we uſe a convenient quantity and meaſure in our meats, howſoever laudable they be, we ſhall never reap theſe fruits of health we hoped for. For they yeeld matter of diſeaſes, by the only exceſs of their quantity; but we may by this know the force of quantity on both parts, becauſe often the poiſonous quality of meats of ill nouriſhment doth not hurt, by reaſon they were not taken into the body into a great quantity. That meaſure of quantity is chiefly to be regarded in diſeaſes: for as *Hippocrates* ſaith, If any give meat to one ſick of a Feaver, he gives ſtrength to the well, and increaſes the diſeaſe to the ſick, eſpecially if he do not uſe a mean. Wherefore it is a thing of no ſmall conſequence, to know what diſeaſes require a ſlender, and what a large diet; of which thing there is large relation made in the 1 *Sect.* of the Aphoriſms of *Hippocrates*; where he teacheth, the ſick muſt feed more largely in the beginnings of long diſeaſes, whereby they may be enabled to endure the length of the diſeaſe, and laſt to the ſtate thereof. But in ſharp and violent diſeaſes, which preſently come to their height, we muſt uſe a ſlender diet; but moſt ſlender, when the diſeaſe is in the height; and beſides, all our conſultations in this kinde, muſt be referred to the ſtrength of the Patients. But thoſe who enjoy their perfect health, muſt uſe a quantity of meat, agreeable to their evacuation and tranſpiration; for men, by reaſon of the ſtrength of their heat, and the more copious diſſipation of the triple ſubſtance, have greater appetite than women; altogether by the ſame reaſon, that young people, and ſuch as grow, need more frequent and plentifull nouriſhment, than old men; and alſo amongſt young men of the like age, ſome do rightly require more copious nouriſhment than otherſome, that is, according to the quantity of their evacuations and cuſtom. Certainly for gluttony, it is ſuch as may be extended to all; but we all ſhould take ſo much meat and drink, that our powers may be refreſhed and not oppreſſed; for by the decree of *Hippocrates*, theſe be the two compendiary ways of preſerving health; not to be over-filled with meat, and to be quick to work; and thus much of the quantity of meats. Neither muſt theſe who are either ſound, or ſick, have leſs regard to the qualities of their Meats; and thoſe are either the firſt, as heating, cooling, moiſtening, drying; or the ſecond, attenuating, incraſſating, obſtructing, opening, or ſome other-like, working according to the condition of their nature. The manner of our diet is not only to be framed according to

Their quantity

The quantity of meats muſt be eſteemed according to the nature of the diſeaſe, and ſtrength of the Patient.

The qualities of meat.

to theſe, but alſo to be varied; for the preſent ſtate of ſuch as be in health, requires to be preſerved by the uſe of like things. As hot and moiſt nouriſhment is to be preſcribed to children, as to thoſe which are hot and moiſt: and cold and dry to old men, as to thoſe who are cold and dry; if ſo be that vulgar ſaying be true, that, *Health delights in the uſe of like things*. Yet becauſe Old-age how green and new-begun howſoever it be, is of it ſelf, as it were, a diſeaſe, it ſeems to be more convenient, both to truth, and for health, that old people ſhould eat meats contrary to their nature, that is, hot and moiſt, that ſo we may defer as much as we can, the cauſes of death, cold and drineſs, which haſten the deſtruction of that age. For we muſt reſiſt diſeaſes by the uſe of their contraries, as thoſe things which are contrary to nature. For otherwiſe, as much meat as you give to the ſick, you add ſo much ſtrength to the diſeaſe. And the ſame is the cauſe why *Hippocrates* ſaid, that a moiſt diet is convenient for all ſuch as are ſick of Feavers, becauſe a Feaver is a dry diſtemperature. Therefore we muſt diligently pry into the nature of the diſeaſe, that knowing it, we may endevour to abate its fury by the uſe of contraries.

Old-age is a diſeaſe.

Aphor. 16. *ſect.* 1.

The force of Cuſtom.

But if Cuſtom (as they ſay) be another nature, the Phyſitian muſt have a great care of it, both in ſound and ſick. For this ſometimes by little and little, and inſenſibly, changes our naturall temperament, and in ſtead thereof gives us a borrowed temper. Wherefore if any would preſently or ſodainly change a Cuſtom which is ſometimes ill, into a better, truly he will bring more harm than good; becauſe all ſodain changes (according to the opinion of *Hippocrates*) are dangerous. Wherefore if neceſſity require that we ſhould withdraw any thing from our Cuſtom, we muſt do it by little and little, that ſo nature may by degrees be accuſtomed to contraries without violence, or the diſturbance of its uſuall government. For that meat and drink which is ſomwhat worſe, but more pleaſant and familiar by cuſtom, is to be preferred (in *Hippocrates* opinion) before better, but leſs pleaſant and accuſtomed. Hence is it, that Country-men do very well digeſt Beef and Bacon, which commonly they uſe; but will turn into nidorulent vapors, Partridg, Capons, and other meat of good nouriſhment, ſooner than change them into good and laudable *Chylus*. The cauſe of which thing is not only to be attributed unto the property of their ſtronger, & as it were, burning heat, but much more to Cuſtom; which by a certain kind of familiarity, cauſeth that meats of hard digeſtion, are eaſily turned into laudable blood. For the force of Cuſtom is ſo great, that accuſtomed Meats are more acceptable; whereby it comes to paſs, that while the ſtomach delights in them, it more ſtraitly embraces them, and happily digeſts them, without any trouble of loathing, vomiting, or heavineſs. All the contrary meet and happen in the uſe of Meats which are unpleaſant to the taſte and ſtomach. For the ventricle abhorring thoſe things, makes manifeſt how it is troubled by its acide and nidorulent belchings, loathing, nauſeouſneſs, vomit, heavineſs, pain of the head, and trouble of the whole body.

Aphor. 9. *ſect.* 2.

Aphor. 38. *ſect.* 2.

Accuſtomed meats are more gratefull, and ſo by that means more nouriſhing.

Wherefore we muſt diligently enquire, what Meats the Patient chiefly delighted in, that by offering them, his appetite languiſhing by reaſon of ſome great evacuation, vomit, or the like, may be ſtirred up. For it will be better and more readily reſtored by things acceptable, though they be ſomewhat worſe, as we noted a little before out of *Hippocrates*. By which words he plainly taught, that it is the part of a good and prudent Phyſitian to ſubſcribe to, and pleaſe the palat of his Patient.

The order of eating our meats.

But ſeeing that order is moſt beautifull in all things, it is truly very neceſſary in eating our Meat: for how laudable ſoever the Meats be in their quantity and quality, howſoever familiar by uſe, and gratefull by cuſtom, yet unleſs they be eaten in due order, they will either trouble or moleſt the ſtomach, or be ill, or ſlowly and difficultly concocted; wherefore we muſt diligently obſerve, what Meats muſt be eaten at the firſt, and what at the ſecond courſe; for thoſe Meats which be hard to concoct, are not to be eaten before thoſe which are eaſie of digeſtion; neither dry and aſtringent things, before moiſtening and looſing.

We muſt begin our meals with moiſt or liquid meat.

But on the contrary, all ſlippery, fat, and liquid things, and which are quickly changed, ought to go before, that ſo the belly may be moiſtned; and then aſtringent things muſt follow, that the ſtomach, by their help, being ſhut and drawn together, may more ſtraitly comprehend the Meat on every ſide, and better perform the Chylification by its proper heat united and joined together.

For this cauſe *Hippocrates*, *Lib. de victu in acutis*, commands thoſe things to be always eaten in the morning, which are fit to looſen the belly, and in the evenings ſuch as nouriſh the body. Yet notwithſtanding drink ought not to precede or go before meat, but on the contrary meat muſt precede drink, by the order preſcribed by him.

The time of eating.

Whether ought we in our eating to have leſs care of the time, than we have of the order; for the time of eating of ſuch as are healthfull, ought to be certain and fixt; for at the accuſtomed hour, and when hunger preſſes, any ſound man, and which is at his own diſpoſure may eat, but exerciſe and accuſtomed labors ought to go before; for it is fit, according to the precept of *Hippocrates*, that labor precede meat, whereby the excrements of the third concoction may be evacuated; the native heat increaſed, and the ſolid parts confirmed and ſtrengthened, which are three commodities of exerciſe very neceſſary to

The profit of labour before meat.

the

the convenient taking of meat. But in ſick perſons we can ſcarce attend and give heed to theſe circumſtances of time, and accuſtomed hour of feeding; for that Indication of giving meat to the ſick, is the beſt of all, which is drawn from the motion of the diſeaſe, and the declining of the fit: for if you give meat in feavers, ſpecially the fit then taking the Patient, you nouriſh not him, but the diſeaſe. For the meat then eaten, is corrupted in the ſtomach, and yeelds fit matter for the diſeaſe: For meat (as we noted before out of *Hippocrates*) is ſtrength to the ſound, and a diſeaſe to the ſick, unleſs it be eaten at convenient time, and diligent care be had of the ſtrength of the Patient, and greatneſs of the diſeaſe.

We muſt not give meat in a fit of a Feaver.

But neither is it convenient that the meat ſhould be ſimple, and of one kind, but of many ſorts, and of divers diſhes dreſſed after different forms, leſt nature by the continuall and hatefull feeding upon the ſame meat, may at the length loath it, and ſo neither ſtraitly contain it, nor well digeſt it; or the ſtomach accuſtomed to one meat, taking any loathing thereat, may abhor all other; and as there is no deſire of that we do not know, ſo the dejected appetite cannot be delighted and ſtirred up with the pleaſure of any meat which can be offered. For we muſt not credit thoſe ſuperſtitious or too nice Phyſitians, who think the digeſtion is hindred by the much variety of meats.

Variety of meats.

The matter is far otherwiſe, for by the pleaſure of what things ſoever the ſtomach allured doth require, it embraces them more ſtraitly, and concocts them more perfectly. And our nature is deſirous of variety.

Why variety of meats is good.

Moreover, ſeeing our body is compoſed of a ſolid, moiſt, and airy ſubſtance, and it may happen, that by ſo many labors, which we are compelled to undergo and ſuſtain in this life, one of theſe may ſuffer a greater diſſipation and loſs than another; therefore the ſtomach is neceſſarily compelled to ſeek more variety, leſt any thing ſhould be wanting to repair that which is waſted. But alſo the age and ſeaſon of the year, yeeld Indications of feeding, for ſome things are convenient for a young man, ſome for an old; ſome in ſummer, ſome in winter. Wherefore we ought to know what befits each age and ſeaſon. Children need hot, moiſt, and much nouriſhment, which may not only ſuffice to nouriſh, but increaſe the body. Wherefore they worſt endure faſting, and of them, eſpecially thoſe who are the moſt lively and ſpiritfull. With old men it is otherwiſe, for becauſe their heat is ſmall, they need little nouriſhment, and are extinguiſhed by much. Wherefore old men eaſily endure to faſt; they ought to be nouriſhed with hot and moiſt meats, by which their ſolid parts now growing cold and dry, may be heated and moiſtned, as by the ſweet nouriſhment of ſuch like meats. Middle-ag'd men delight in the moderate uſe of contraries, to temper the exceſs of their too acrid heat. Young people as temperate, are to be preſerved by the uſe of like things.

Indications of feeding, taken from the age.

The manner of Diet in Winter muſt be hot, and inclining to drineſs. Wherefore then we may more plentifully uſe roſt-meats, ſtrong wines and ſpices; becauſe in the Winter-ſeaſon we are troubled with the cold and moiſt air, and at the ſame time, have much heat inwardly; for the inner parts, according to *Hippocrates*, are naturally moſt hot in the Winter and the Spring, but feaveriſh in Summer; ſo the heat of Summer is to be tempered by the uſe of cold and moiſt things, and much drink. In the temperate Spring all things muſt be moderate; but in Autumn, by little and little, we muſt paſs from our Summer to our Winter diet.

Indication from the time of the year.

CHAP. XV.

Of Motion and Reſt.

What motion ſignifies.

HEre Phyſitians admoniſh us, that by the name of Motion, we muſt underſtand all ſorts of exerciſes, as walking, leaping, running, riding, playing at tennis, carrying a burden, and the like. Friction or rubbing is of this kind, which in times paſt was in great uſe and eſteem, neither at this day is it altogether neglected by Phyſitians. They mention many kinds of it, but they may be all reduced to three; as, one gentle, another hard, a third indifferent; and that of the whole body, or only of ſome part thereof. The Friction is called hard, which is made by the rough, or ſtrong preſſure of the hands, ſponges, or a courſe and new linnen cloth: it draws together, condenſates, binds and hardens the fleſh, yet if it be often and long uſed, at length it rarifies, diſſolves, attenuates, and diminiſhes the fleſh, and any other ſubſtance of the body; and alſo it cauſeth revulſion, and draws the defluxion of humors from one part to another. The gentle Friction, which is performed by the light rubbing of the hand, and ſuch like, doth the contrary; as, ſoftens, relaxes, and makes the skin ſmooth and unwrinkled; yet unleſs it be long continued, it doth none of theſe worthy to be ſpoken of. The indifferent kinds, conſiſting in the mean betwixt the other two, increaſeth the fleſh, ſwels or puffs up the habit of the body, becauſe it retains the blood and ſpirits which it draws, and ſuffers them not to be diſſipated.

Three kinds of Frictions.

Hard.

Gentle.

Indifferent.

The use of exercises.

The benefit of exercise is great, for it increases naturall heat, whereby better digestion follows, and by that means nourishment, and the expulsion of the excrements; and lastly, a quicker motion of the spirits, to perform their offices in the body, all the ways and passages being cleansed. Besides, it strengthens the respiration, and the other actions of the body, confirms the habit, and all the limbs of the body, by the mutuall attrition of the one with the other; whereby it comes to pass they are not so quickly wearied with labor. Hence we see that Country people are not to be tired with labor.

What the fittest time for exercise.

If any will reap these benefits by exercise, it is necessary that he take opportunity to begin his exercise, and that he seasonably desist from it, not exercising himself violently and without discretion; but at certain times according to reason.

Wherefore the best time for exercise will be before meat (that the appetite may be increased by augmenting the naturall heat) all the excrements being evacuated, lest nature being hungry and empty, do draw and infuse the ill humors contained in the guts and other parts of the body, into the whole habit, the liver, and other noble parts. Neither is it fit presently, after meat, to run into exercise, lest the crude humors and meats not well concocted, be carried into the veins. The measure and bounds of exercise must be, when the body appears more full, the face looks red, sweat begins to break forth, we breath more strongly and quick, and begin to grow weary; if any continue exercise longer, stiffness and weariness assails his joints, and the body flowing with sweat suffers a loss of the spirituous and humid substance, which is not easily repaired; by which it becomes more cold, and lean even to deformity.

The quality of exercise.

The quality of exercise which we require, is in the midst of exercise, so that the exercise must be neither too slow and idle, neither too strong nor too weak, neither too hasty nor remiss, but which may move all the the members alike. Such exercise is very fit for sound bodies. But if they be distempered, that sort of exercise is to be made choice of, which by the quality of its excess, may correct the distemper of the body, and reduce it to a certain mediocrity. Wherefore such men as are stuffed with cold, gross, and viscous humors, shall hold that kind of exercise most fit for them, which is more laborious, vehement, strong, and longer continued. Yet so, that they do not enter into it before the first and second concoction, which they may know by the yellowness of their urine. But let such as abound with thin and cholerick humors, chuse gentle exercises, and such as are free from contention, not expecting the finishing of the second concoction, for the more acride heat of the solid parts delights in such half concocted juices, which otherwise it would so burn up, all the glutinous substance thereof being wasted, that they could not be adjoyned or fattened to the parts. For the repeating or renewing of exercise, the body should be so often exercised, as there is a desire to eat. For exercise stirs up and revives the heat which lies buried and hid in the body: for digestion cannot be well performed by a sluggish heat; neither have we any benefit by the meat we eat, unless we use exercise before.

For whom strong exercises are convenient.

* Antigymnastica.

The last part of exercise begun and performed according to reason, is named, * *The ordering of the body*, which is performed by an indifferent rubbing and drying of the members; that so the sweat breaking forth, the filth of the body, and such excrements lying under the skin, may be allured and drawn out; and also that the members may be freed from stiffness and weariness. At this time it is commonly used by such as play at Tennis.

What discommodities proceed from idleness.

But, as many and great commodities arise from exercise conveniently begun and performed, so great harm proceeds of idleness; for gross and vicious juices heaped up in the body commonly produce crudities, obstructions, stones both in the reins and bladder, the Gout, Apoplexie, and a thousand other diseases.

CHAP. XVI.

Of Sleep and Watching.

THat this our speech of Sleep and Watching, which we now intend, may be more plain, we will briefly declare, what commodity or discommodity they bring; what time and what hour is convenient for both; what the manner of lying must be, and the choice thereof; what the dreams in sleeping, and what pains or heavinesse and chearfulness after sleep may portend.

What sleep is.

Sleep is nothing else than the rest of the whole body, and the cessation of the Animall faculty from sense and motion. Sleep is caused, when the substance of the brain is possessed, and after some sort overcome and dulled by a certain vaporous, sweet and delightsome humidity; or when the spirits almost exhaust by performance of some labor, cannot any longer sustain the weight of the body, but cause rest by a necessary consequence, by which means nature may produce other from the meat by concoction turned into blood.

The use of sleep.

Sleep fitly taken much helps the digestion of the parts, because in the time of rest, the heat being the worker of all concoction, is carried back to them, together with the spirits

ſpirits. Neither doth ſleep only give eaſe to the wearied members, but alſo leſſens our cares, and makes us to forget our labors.

The night is a fit time to ſleep and to take our reſt in, as inviting ſleep by its moiſture, ſilence and darkneſs. For the heat and Spirits in the thick obſcurity of night, are driven in and retained in the center of the body; as on the contrary by the daily, and as it were, friendly and familiar light of the Sun, they are allured and drawn forth into the ſuperficies, and outward part of the body; from whence they leave ſleeping, and begin to wake. Beſides alſo, which makes not a little to that opportunity and benefit which we look for from ſleep, the night ſeaſon ſuffices for the work of juſt and perfect concoction. Which is one reaſon amongſt many that ſleep on the day time may be hurtfull. For we are wakened from our ſleep by the heat and ſpirits, called forth to the skin either by the light, or noiſe on the day time, before that the concoction which was begun be finiſhed. But that ſleep cannot but be light which comes without neceſſity of ſleeping. Wherefore the concoction being attempted, but not perfected, the ſtomach is filled with crudities, diſtended with acide or ſour belchings, and the brain troubled with groſs vapors and excrementitious humidities. From whence proceeds pain and heavineſs of the head, and ſtore of cold diſeaſes. But although ſleep on the night time be wholſome, yet it is fit, that it be reſtrained within the limits of an indifferent time. For that which exceeds, hinders the evacuation of excrements both upwards and downwards: but in the mean time the heat which is never idle, draws from them ſome portion or vapor into the veins, principall parts and habit of the body, to become matter for ſome diſeaſe. We muſt meaſure this time, not by the ſpace of hours, but by the finiſhing the work of concoction, which is performed in ſome ſooner than in other ſome. Yet that which is longeſt is perfected and done in ſeven or eight hours. The ventricle ſubſiding and falling into its ſelf and its proper coats, and the urine tinctured yellow, gives perfect judgment thereof. For on the contrary the extenſion of the ſtomach, acide belching, pain of the head, and heavineſs of the whole body, ſhew that the concoction is unperfect.

Fit time for ſleep and the nature of the night.

Sleep on the day-time.

There ought to be a moderation of our nights ſleep.

How to be known.

In ſleeping we muſt have ſpeciall care of our lying down; for firſt we muſt lye on our right ſide, that ſo the meat may fall into the bottom of our ſtomach, which being fleſhy, and leſs membranous, is the hotter, and more powerfull to aſſimilate. Then a little after we muſt turn upon our left ſide, that ſo the Liver with its Lobes, as with hands may on every ſide embrace the ventricle, and as fire put under a kettle, haſten the concoction. Laſtly, towards morning it will not be unprofitable to turn again upon our right ſide, that by this ſituation the mouth of the ſtomach being opened, the vapors which ariſe from the elixation of the *Chylus* may have freer paſſage. Lying upon the back is wholly to be avoided; for from hence the Reins are inflamed, the Stone is bred, Palſies, Convulſion, and all diſeaſes which have their originall from the defluxion into the ſpinall marrow, and to the Nerves taking beginning from thence. To lye upon the belly is not unprofitable for ſuch as have uſed to lye ſo, if they be not troubled with defluxions into the eys; for ſo the humor will more eaſily flow into the part affected. But thus the work of concoction is not a little furthered, becauſe by that form of lying, not only the inward heat is contained and gathered together about the ventricle, but the encompaſſing warmneſs of the ſoft feathers of the bed aids and aſſiſts it.

What the form and fite of our body ought to be while we ſleep.

The harm of lying on our backs.

Upon our bellies.

Neither are the Dreams which we have in our ſleep to be neglected, for by the diligent conſideration of theſe, the affections and ſuperfluous Humors which have chief power in the body are marvailouſly known. For thoſe who have raging choler running up and down their bodies while they ſleep, all things to them appear bright, ſhining, fiery, burning, full of noiſe and contention. Thoſe who abound with Phlegm, dream of floods, ſnows, ſhowers, and inundations and falling from high places. Thoſe who are Melancholy dream of gapings and gulfs in the earth, thick and obſcure darkneſs, ſmokes, caves, and all black and diſmall things. But thoſe whoſe bodies abound in blood, dream of marriages, dances, embracings of women, feaſts, jeſts, laughter, of orchards and gardens; and to conclude, of all things pleaſant and ſplendent.

The conſideration of dreams.

Alſo we muſt obſerve how the Patient doth after ſleep, whether more lively and chearfull, or more heavie: for by the opinion of *Hippocrates*,

> *Cum labor à ſomno eſt, lethalem cellige morbum:*
> *Sin proſit ſomnus, nihil hinc Lethale timendum eſt.* *Aphor. 1. ſect. 2.*
>
> Pain ſleep enſuing, an ill diſeaſe doth ſhow:
> But if ſleep profit bring, no harm from thence will flow.

And as ſleep, ſo watching, if it exceed meaſure, is hurtfull; for it hurts the temperature of the brain, weakens the ſenſes, waſtes the ſpirits, breeds crudities, heavineſs of the head, falling away of the fleſh, and leanneſs over all the body; and to conclude, it makes ulcers more dry, and ſo conſequently rebellious, difficult to heal and malign. There are many other things may be ſpoken of ſleep and watching, but theſe may ſuffice a Chirurgeon.

CHAP. XVII.

Of Repletion, and Inanition, or Emptineſs.

The kinds of Repletions, or rather of Exceſſes.

THere are, to be ſhort, two ſorts of Repletion, or of all exceſs; one is of a ſimple quality, without any defluxion, or ſociety of any humor, as appears in diſtempers without matter: the other is of quantity and maſs, the body being diſtended with too much meat, or too great quantity of humors; from whence proceed an infinite number of diſeaſes. They call the Repletion of meats, ſatiety or fulneſs; and it is of two kinds: The one which is called * Repletion or Fulneſs to the veſſels; the other * Repletion to the ſtrength.

*Repletio { ad vaſa / ad vires

We judg of ſatiety to the veſſels, by the diſtention and ſwelling of the veins and entrails, as the ſtomach. We call ſatiety to the ſtrength, when the body is loaded with more meats than it can well bear. But alſo there is a double Repletion of humors. For either it is of ſome one humor, or of all the humors; they call this by a peculiar name, *Plethora*. For *Galen* defines *Plethora* an equal exceſs of all the humors. For if at any time he define a *Plethora* to be an exceſs of blood only; then verily by the name of blood, he underſtands an equal comprehenſion of the four humors; as it is taught in Phyſick ſchools.

Gal. Meth. 13. *cap.* 6.

What *Cacochymia*.

The Repletion which is cauſed by ſome one humor, is termed by *Galen* in the place before mentioned, *Cacochymia*, (that is, An evil juice) whether the Repletion proceed of a Cholerick, Melancholick, Phlegmatick, or ſerous Humor.

The kinds of evacuation.

Now Inanition, or evacuation is no other thing than the expulſion or effuſion of humors which are troubleſome, either in quantity or quality. Of Evacuations, ſome are univerſall, which expell ſuperfluous humors from the whole body; ſuch are purging, vomiting, tranſpiration, ſweats, Phlebotomy. Some particular, which are performed only to evacuate ſome part, as the brain by the noſe, palat, eys, ears; the lungs by the weazon; the ſtomach by vomit and ſtool; the guts by ſtool; the liver and the ſpleen by urine and ordure. Theſe evacuations are ſometimes performed by nature, freeing it ſelf of that which is troubleſome to it; otherwhiles by the Art of the Phyſitian in imitation of nature.

And again, one of theſe is good and requiſite, when only the humor which is hurtfull either in quantity or quality, is evacuated; The other not requiſite, or immoderate, when the profitable Humors, together with the unprofitable, are expelled.

The commodities of moderate ſcratching.

But what evacuations ſoever theſe be, they are performed and done, either by the ſcratching and rubbing of the skin, as when a Cholerick, ſalt, or ſerous Humor, or ſome windineſs lying between the skin and the fleſh, cauſe itching. For by ſcratching the skin, it gets paſſage out, which is manifeſt by the efflux of a ſerous matter burning, or cauſing ſcabs and ulcers, if the humor be ſomewhat groſs, but inſenſible and not ſo manifeſt, if it be windineſs, the skin by that rubbing being rarified, and the groſs flatulency attenuated. Wherefore they do ill who hinder their Patients from ſcratching, unleſs they ſcratch ſo cruelly and hard, that there may be danger (by reaſon of the great heat and pain thereby cauſed) of ſome defluxion or falling down of humors into the part.

Or theſe evacuations are performed by much matter evacuated from an opened Bile, or running Ulcer, a Fiſtula, or ſuch like ſores. Or by ſweats which are very good and healthfull, eſpecially in ſharp diſeaſes, if they proceed from the whole body, and happen on the criticall days. By vomit, which often violently draws theſe humors from the whole body, even from the utmoſt joints, which purging medicins could not evacuate, as we may ſee in the Palſie, and Sciatica, or Hip-gout. By ſpitting, as in all who are ſuppurated either in the ſides or lungs. By Salivation, or a Phlegmatick flux by the mouth, as in thoſe who are troubled with the French-pox. By ſneezing and blowing the noſe; for by theſe, the brain oppreſt with moiſture, disburdeneth its ſelf, whether it be done without, or with the help of ſternutatories and errhines; wherefore children, and ſuch as have ſomewhat moiſt brains, purge themſelves often this way. By hicket and belching; for by theſe the windineſs contained in the ſtomach, is often expelled. By urine, for by this not only Feavers, but which is more to be admired, the French-pox hath often been terminated and cured.

The force of vomits.

Salivation.

The whole body is alſo purged by urine.

For there have been ſome troubled with the Pox, in whom a flux of the vicious and venenate humor could not by Unctions of quickſilver be procured, either from the mouth or belly; yet have been wonderfully freed by abundance of urine, both from danger of death and their diſeaſe. By bleeding; for nature hath often found a way for grievous diſeaſes, eſpecially in young bodies, by bleeding at the noſe, and by their courſes in women. By a flux, or lask, purgation, ſweats; inſenſible evacuation and tranſpiration; for ſo tumors, the matter being brought to ſuppuration, do ſometimes vaniſh away and are diſſolved, both of their own accord, as alſo by diſſolving or diſcuſſing medicins. We do the ſame by exerciſe, diet, hot-houſes, long ſleep, waking, and ſhedding of tears. By ſucking, as with cupping-glaſſes, and horſ-leeches, in wounds made by venemous bitings.

In

In all such kinds of evacuations, we must consider three things, the quantity, quality, and manner of evacuation. As for an example, when an *Empyema* is opened, the matter which runs out, ought to be answerable in proportion to the purulent matter, which was contained in the capacity of the breasts; otherwise, unless all the matter be emptied, there may happen a relapse; the matter should be white, soft, equal, and nothing stinking: Lastly, you must let it forth not all together, and at one time, but by little and little, and at severall times, otherwise not a little quantity of the Spirits and heat doth flow out together, with the unprofitable matter, and so consequently a dissolution of all the powers.

We must observe three things in every evacuation.

CHAP. XVIII.

Of the Perturbations, or Passions of the minde.

THe Perturbations are commonly called the Accidents of the minde, because as bodily accidents from the body, so may these be present and absent from the mind, without the corruption of the subject. The knowledg of these must not be lightly passed over by the Chirurgeon; for they stir up great troubles in the bodies, and yeeld occasion of many and great diseases; of which things, joy, hope, and love, may give an apparent testimony. For by these motions the heat and spirits are sometimes gently, sometimes violently diffused over all the body, for the enjoying of the present, or hoped for good. For then the heart is dilated, as to embrace the thing beloved, and the face is died with a rosie and lively colour. For it is likely, that the faculty it self is stirred by the object, by whose power the heart it self is moved.

Why the Passions of the minde are called Accidents. Their force.

For it is first necessary, before we be moved by any Passions, that the senses in their proper seats, in which they are seldom deceived, apprehend the objects, and straight, as messengers carry them to the common sense, which sends their conceived forms to all the faculties. And then, that each faculty, as a Judge may afresh examin the whole matter, how it is, and conceive in the presented objects some shew of good, or ill, to be desired, or shunned. For what man that was well in his wits, did ever fall into a laughter, unless he formerly knew, or saw somewhat said or done, which might yeeld occasion of laughter? Therefore Joy proceeds from the heart, for the thing causing mirth or joy, being conceived, the faculty moves the heart, which shaken and moved by the faculty which hath dominion over it, is dilated and opened, as ready to embrace the exhilarating object. But in the mean time by the force of that dilatation, it sends forth much heat, and spirits together with the bloud into all the body. A great part of which comming to the face, dilates it, the forehead is smooth and plain, the eies look bright, the cheeks become red, as died with Vermilion, the lips and mouth are drawn together, and made plain and smooth; some have their cheeks dented with two little pits (which from the effects are called laughing cheeks) because of the contraction or curling, which the muscles suffer by reason of their fulness of bloud and spirits, all which to be brief is nothing but to laugh.

From whence they have their force.

The reason of Joy.

Joy recreates and quickens all the faculties, stirs up the spirits, helps concoction, makes the body to be better liking, and fattens it, the heat, bloud, and spirits flowing thither, and the nourishing dew or moisture, watering and refreshing all the members; from whence it is, that of all the passions of the mind, this only is profitable, so that it exceed not measure; for immoderate and unaccustomed joy carries so violently the bloud and spirits from the heart, into the habit of the body, that sodain and unlookt for death ensues, by a speedy decay of the strength, the lasting fountain of the vitall humour being exhausted. Which thing principally happens to those who are less hearty, as women and old men.

The effects of Joy.

Anger causeth the same effusion of heat in us, but far speedier than joy; therefore the spirits and humors are so enflamed by it, that it often causes putrid feavers, especially if the body abound with any ill humour.

Anger.

Sorrow, or grief dries the body by a way quite contrary to that of anger, because by this the heart is so straitned, the heat being almost extinct, that the accustomed generation of spirits cannot be performed; and if any be generated, they cannot freely pass into the members with the bloud; wherefore the vitall faculty is weakned, the lively colour of the face withers and decays, and the body wastes away with a lingering consumption.

Sorrow.

Fear in like sort draws in and calls back the spirits, and not by little and little as in sorrow, but sodainly and violently; hereupon the face growes sodainly pale, the extreme parts cold, all the body trembles or shakes, the belly in some is loosed, the voice as it were stays in the jawes, the heart beats with a violent pulsation, because it is almost oppresst by the heat, strangled by the plenty of bloud, and spirits aboundantly rushing thither; The hair also stands upright, because the heat and bloud are retired to the inner parts, and the utmost parts are more cold and drie than stone; by reason whereof the utmost skin and the pores, in which the roots of the hairs are fastned, are drawn together.

Fear.

Hippocr. lib. 4. de Morb.

Shame.

Shame is a certain affection mixed, as it were, of Anger and Fear; therefore if, in that conflict of, as it were, contending passions, Fear prevail over Anger, the face waxeth pale, (the blood flying back to the heart;) and these or these Symptomes rise, according to the vehemency of the contracted and abated heat. But if on the contrary, Anger get the dominion over Fear, the blood runs violently to the face, the eyes look red, and sometimes they even fome at the mouth.

Shamefastnes.

There is another kind of shame, which the *Latins* call *Verecundia* (we Shamefastnes) in which there is a certain flux, and reflux of the heat, and blood, first recoiling to the heart, then presently rebounding from thence again. But that motion is so gentle, that the heart thereby suffers no oppression, nor defect of spirits; wherefore no accidents worthy to be spoken of, arise from hence: this affect is familiar to young maids and boyes, who if they blush for a fault committed unawares, or through carelesnes, it is thought an argument of a vertuous and good disposition.

An agony.

But an agony, which is a mixt passion of a strong fear, and vehement anger, involves the heart in the danger of both motions; wherefore by this passion, the vitall faculties is brought into very great danger. To these six Passions of the mind, all other may be revoked, as Hatred and Discord, to Anger: Mirth and Boasting, to Joy; Terrors, Frights and Swoundings, to Fear; Envy, Despair and Mourning, to Sorrow.

By these it is evident, how much the passions of the mind can prevail, to alter and overthrow the state of the body; and that by no other means, than that by the compression and dilatation of the heart, they diffuse and contract the spirits blood, and heat; from whence happens the dissipation, or oppression of the spirits.

Why the first signs of passions of the mind appear in the face.

The signes of these Symptomes quickly shew themselves in the face; the heart, by reason of the thinnes of the skin in that part, as it were painting forth the notes of its affections. And certainly the face is a part so fit to disclose all the affections of the inward parts, that by it you may manifestly know an old man from a young, a woman from a man, a temperate person from an untemperate, an *Ethiopian* from an *Indian*, a *Frenchman* from a *Spaniard*, a sad man from a merry, a sound from a sick, a living from a dead. Wherefore many affirm that the manners, and those things which we keep secret and hid in our hearts, may be understood by the face and countenance.

The use of passions of the mind.

Now we have declared what commodity and discommodity may redound to the man from these forementioned passions, and have shewed that anger is profitable to none, unless by chance to some dull by reason of idleness, or oppress with some cold, clammy and phlegmatick humor; and fear convenient for none, unless peradventure for such as are brought into manifest and extream danger of their life by some extraordinary sweat, immoderate bleeding, or the like unbridled evacuation: Wherefore it behoves a wise Chirurgeon to have a care, lest he inconsiderately put any Patient committed to his charge into any of these passions, unless there be some necessity thereof, by reason of any of the forementioned occasions.

CHAP. XIX.

Of things against Nature, and first of the Cause of a disease.

What things against nature are.

What, and how many the causes of diseases be.

HAving intreated of things naturall, and not naturall, now it remains we speak of things (which are called) against nature, because that they are such as are apt to weaken & corrupt the state of our body. And they be three in number; The cause of a disease, a Disease, and a Symptome. The cause of a disease is an affect against nature, which causes the disease. Which is divided into Internall and Externall. The External, originall or primitive comes from some other place, and outwardly into the body: such be meats of ill nourishment, and such weapons as hostilely wound the body.

The primitive cause.

Internall antecedent.

The Internall have their essence and seat in the body, and are subdivided into antecedent and conjunct. That is called an antecedent cause, which as yet doth not actually make a disease, but goes near to cause one; so humors copiously flowing, or ready to flow into any part, are the antecedent causes of diseases; The conjunct is that which actually causes the disease, and is so immediately joyned in affinity to the disease, that the disease being present, it is present, and being absent, it is absent.

Internall conjunct.

Again, of all such causes, some are born together with us, as the over-great quantity and malign quality of both the seeds, and the menstruous blood from diseased Parents are causes of many diseases, and specially of those which are called Hereditary.

Other happen to us after we be born, by our diet and manner of life, a stroke, fall or such other like. Those which be bred with us, cannot be wholly avoided or amended, but some of the other may be avoided, as a stroke and fall; some not, as those which necessarily enter into our body, as Air, Meat, Drink, and the like.

The congenit, or inevitable cause of death.

But if any will reckon up amongst the internal, inherent, and inevitable causes, the dayly, nay hourely dissipation of the radicall moisture, which the naturall heat continually preys upon;

upon; I do not gainsay it, no more than that division of Causes celebrated and received of Philosophers, divided into Materiall, Formall, Efficient, and Finall; for such a curious contemplation belongs not to a Chirurgeon, whom I only intend plainly to instruct. Wherefore that we have written may suffice him.

CHAP. XX.

Of a Disease.

A Disease is an affect against Nature, principally, and by it self, hurting and depraving the action of the part in which it resides. The division of a Disease is threefold; Distemperature, ill Conformation, and the Solution of Continuity. What a disease is, and how various.

Distemperature is a Disease of the similar parts dissenting, and changed from their proper and native temper. That digression from the native temper, happens two ways; either by a simple distemperature from the excess of one quality; and this is fourfold, Hot, Cold, Moist, and Dry; or by a compound distemperature, by the excess of two qualities, which also is foursold, Hot and Moist, Hot and Dry; Cold and Moist, Cold and Dry. Again, every distemper is the fault of one simple and single quality, as an inflammation; or hath some vicious humors joined with it, as a Phlegmon. Again, a Distemperature is either equal, as in a *Sphacele*; or unequal, as in a *Phlegmon*, beginning or increasing. A Distemperature.

Ill Conformity is a fault of the organicall parts, whose composure is thereby depraved. This hath four kinds; the first is, when the figure of the part is faulty, either by nature or accident, or some cavitie abolished; as if a part which nature would have hollow for some certain use, do grow or close up: Or lastly, if they be rough, or smooth otherwise than they should, as if that part which should be rough, be smooth, or the contrary. Another is in the magnitude of the part increased, or diminished contrary to nature. The third is in the number of the parts increased or diminished; as if a hand have but four or else six fingers. The fourth is in the site and mutuall connexion of the parts; as if the parts which should be naturally united and continued be pluckt asunder, as happens in Luxations; or the contrary. The third generall kind of disease, is the solution of continuity, a Disease common, both to the similar and organicall parts, acquiring diversity of names, according to the variety of the parts in which it resides. Ill Conformation. Solution of Continuity.

CHAP. XXI.

Of a Symptome.

WE do not in this place take the word Symptome in the most generall acceptation, for every change or accident which happens to man besides his own nature; but more reservedly and specially, only for that change which the disease brings, and which follows the disease, as a shadow doth the body. What a Symptome is.

There be three kindes of a Symptome properly taken. The first is, when the action is hurt; I say hurt, because it is either abolished, weakned, or depraved; so blindness is a deprivation or abolishing of the action of seeing; dulness of sight, is a diminution or weakning thereof; and a suffusion, such as happens at the beginning of a Cataract, when they think flies, hares, and such like bodies fly to and fro before their eys, is a depravation of the sight. Three kinds thereof.

The second is a simple affect of the body, and a full fault of the habit thereof being changed, happening by the mutation of some qualities: such is the changing of the native colour into a red by a Phlegmon, and into a livid and black by a Gangrene; such is the filthy stench the nose affected with a *Polypus* sends forth; the bitter taste, in such as have the saundise; and the rough and rugged skin in them which are Leprous.

The third is the fault of the overmuch retention of excrements which should be expelled, and expulsion of such as should be retained; for the evacuation of an humor profitable both in quantity and quality, is against nature, as bleeding in a body not full of ill Humors, nor Plethorick; and also the retention of things hurtfull in substance, quantity and quality, as the Courses in women, the urine, and the stone in the bladder.

CHAP.

CHAP. XXII.

of Indications.

What Indication is.

THe knowledg and exerciſe of Indications befits that Chirurgeon, whom no blind raſhneſs of fortune, but reaſon; no chance, but counſell directs in the undertaking and performing the works of his Art. For an Indication is a certain ſafe and ſhort way, which leads the Phyſitian, as by the hand, to the attainment of his purpoſed end, of preſerving the ſound, or curing the ſick.

See *Method. Cap. 7 Lib. de opt. ſecta, Cap.* 11.

For *Galen* doth define an Indication to be a certain inſinuation of what is to be done, or a quick and judicious apprehenſion of that which may profit or hurt. And as Faulconers, Mariners, Plowmen, Souldiers, and all manner of Artizens, have their peculiar terms and words, which are neither known, nor uſed by the vulgar; ſo this word Indication is proper and peculiar to Phyſitians and Chirurgeons, as a Term of Art not vulgar; by conſideration of which, as by ſome ſign, or ſecret token, they are admoniſhed what is to to be done to reſtore health, or repell an imminent danger.

The kinds of Indications.

There are three prime and principall kinds of Indications, every of which is ſubdivided into many other. The firſt is from things naturall. The ſecond from thoſe things which are termed not naturall. The third from thoſe things which are contrary to nature. Things naturall ſhew they muſt be preſerved by their like, and in the compaſs of theſe are contained all the Indications which are drawn from the nature of the Patient, that is, from his ſtrength, temper, age, ſex, habit, cuſtome, diet.

Things not naturall may be doubted as uncertain, for one while they indicate the ſame things with things naturall, that is, they coindicate with the ſtrength, temper and the reſt; otherwhiles they conſent with things againſt nature, that is, they coindicate with the diſeaſe. Wherefore *Galen* when he ſaith, that Indications are drawn from three things; The diſeaſe, the nature of the Patient, and the encompaſſing air; by propoſing the familiar example of the air, he would have us to underſtand the other things not naturall; becauſe we may ſhun or imbrace them more or leſs as we will our ſelves, but we muſt, whether we will or no, endure the preſent ſtate of the air. Therefore the air indicates ſomething to us, or rather coindicates; for if it nouriſh the diſeaſe, as conſpiring with it, it will indicate the ſame that the diſeaſe, that is, that it muſt be preſerved in the ſame ſtate.

Lib. 9. Method. cap. 9.

Indications drawn from things naturall.

Things contrary to nature indicate they muſt be taken away by their contraries; therefore that we may more accurately and fully handle all the Indications drawn from things naturall, we muſt note, that ſome of theſe are concerning the ſtrength of the Patient, by care to preſerve which, we are often compelled for a time to forſake the cure of the proper diſeaſe: for ſo a great ſhaking happening at the beginning of an ague or feaver, we are often forced to give ſuſtenance to the Patient, to ſtrengthen the powers ſhaken by the vehemency of the ſhaking, which thing notwithſtanding lengthens both the generall and particular fits of the ague. Other pertain to the temper, other reſpect the habit, if the Patient be ſlender, if fat, if well fleſht, if of a rare, or denſe conſtitution of body. Other reſpect the condition of the part affected in ſubſtance, conſiſtence, ſoftneſs, hardneſs, quick or dull ſenſe, form, figure, magnitude, ſite, connexion, principality, ſervice, function and uſe. From all theſe, as from notes, the skilfull Chirurgeon will draw Indications according to the time and part affected: for the ſame things are not fit for ſore eyes, which were convenient for the ears, neither doth the phlegmon in the jaws and throat admit the ſame form of cure, as it doth in other parts of the body. For none can there outwardly apply repercuſſives, without preſent danger of ſuffocation. So there is no uſe of repercuſſives in defluxions of thoſe parts which in ſite are neer the principall. Neither muſt thou cure a wounded Nerve and Muſcle, after one manner. The temperature of a part, as Moiſture, alwayes indicates its preſervation, although the diſeaſe be moiſt, and give Indication of drying, as an ulcer. The principality of a part alwayes inſinuates an Indication of aſtringent things, although the diſeaſe require diſſolving, as an Obſtruction of the Liver; for otherwiſe unleſs you mix aſtringent things with diſſolving, you will ſo diſſolve the ſtrength of the part, that hereafter it cannot ſuffice for ſanguification. If the texture of a part be rare, it ſhews it is leſs apt, or prone to obſtruction; if denſe, it is more obnoxious to that diſeaſe, hence it is that the Liver is oftener obſtructed than the Spleen. If the part be ſituate more deep, or remote, it indicates the medicines muſt be more vigorous and liquid, that they may ſend their force ſo far. The ſenſibleneſs, or quick-ſenſe of the part, gives Indication of milder medicines, than peradventure the ſigns, or notes of a great diſeaſe require. For the Phyſitian which applies things equally ſharp to the Horny tunicle of the eye being ulcerated, and to the Leg, muſt need be counted either cruell, or ignorant. Each ſex and Age hath its Indications, for ſome diſeaſes are curable in youth, which we muſt not hope to cure in old age; for hoarſneſs and great diſtillations in very old men, admit no digeſtion, as *Hippocrates* ſaith.

What the conditions of the parts affected do indicate.

Indications from the ages.

Aphor. 40. li. 2.

Nunquam

Nunquam decrepitus Branchum coquit, atque Coryzam.
The feeble Sire, for age that hardly goes,
Ne're well digests the hurtfull Rheume or poſe.

Moreover according to his decree the diſeaſes of the Reins, and whatſoever pains moleſt the bladder, are difficultly healed in old men; and alſo reaſon perſwades that a Quartain admits no cure in Winter, and ſcarce a Quotidian; and ulcers in like manner are more hard to heal in Winter; that hence we may underſtand certain Indications to be drawn from times; and to increaſe the credit of the variety and certainty of Indications, ſome certaine time, and ſeaſons in thoſe times command us to make choiſe of medicines; for as *Hippocrates* teſtifies; *Aphor. 6 ſect. 6.* *Aphor. 5 ſect. 4.*

Ad Canis ardorem facilis purgatio non eſt.
In Dogdayes heat it is not good,
By purging for to cleanſe the blood.

Neither ſhalt thou ſo well preſcribe a ſlender diet in Winter, as in the Spring, for the air hath its Indications. For experience teaches us, that wounds of the head are far more difficultly and hardly cured, at *Rome*, *Naples*, and *Rochell* in *Xantoigne*. But the times of diſeaſes yeeld the principall Indications, for ſome Medicines are only to be uſed at the beginning and end of diſeaſes, others at the increaſe and vigour of the diſeaſe. Wee muſt not contemn thoſe Indications which are drawn from the vocation of life, and manner of Diet; for you muſt otherwiſe deal with the painfull Husbandman (when he is your Patient) which leads his life ſparingly and hardly, than with the Citizen who lives daintily and idlely. To this manner of life and Diet may be referred a certain ſecret and occult property, by which many are not only ready to vomit at eating of ſome meats, but tremble over all their bodies when they hear them but ſpoken of. I knew a prime Nobleman of the *French* Nobility, who was ſo perplext at the ſerving in of an Eel to the Table, at the midſt of dinner and amongſt his friends, that he fell into a ſwound, all his powers failing him. *Galen* in his book *de Conſuetudine* tells that *Arius* the *Peripatetick* died ſodainly, becauſe compelled by the advice of thoſe Phyſitians he uſed, he drank a great draught of cold water in the intolerable heat of a Feaver. For no reaſon, ſaith *Galen*, than that, becauſe he knowing he had naturally a cold ſtomach from his childhood, perpetually abſtained from cold water.

From our diet.

Hatred ariſing from ſecret properties.

For as much as belongs to Indications taken from things againſt nature; the length and depth of a wound or ulcer indicates one way; the figure cornered, round, equall and ſmooth, unequall and rough, with a hollowneſs ſtreight or winding, indicate otherwiſe; the ſite right, left, upper, lower in another manner, and otherwiſe the force and violence of antecedent and conjunct cauſes. For oftentimes the condition of the cauſe indicates contrary to the diſeaſe, as when abundance of cold and groſs humors cauſe and nouriſh a Feaver. So alſo a Symptome often indicates contrary to the diſeaſe, in which contradiction, that Indication muſt be moſt eſteemed, which doth moſt urge; as for example ſake, if ſwounding happen in a Feaver, the feaveriſh burning ſhall not hinder us from giving wine to the Patient.

Indications taken from things againſt nature.

Wherefore theſe Indications are the principalleſt and moſt noble which lead us, as by the hand, to doe theſe things which pertain to the cure, prevention and mitigating of diſeaſes. But if any object, that ſo curious a ſearch of ſo many Indications is to no purpoſe, becauſe there are many Chirurgeons, which ſetting only one before their eyes, which is drawn from the Eſſence of the diſeaſe, have the report and fame of skilfull Chirurgeons, in the opinion of the vulgar; But let him know that it doth not therefore follow, that this indication is ſufficient for the cure of all diſeaſes; for we do not alwayes follow that which the Eſſence of the diſeaſe doth indicate to be done. But chiefly then, where none of the forerecited Indications doth reſiſt or gainſay; you may underſtand this by the example of a *Plethora*, which by the Indication drawn from the Eſſence of the thing requires Phlebotomy; yet who is it, that will draw blood from a child of three months old? Beſides, ſuch an Indication is not artificiall but common to the Chirurgeon with the common people. For who is it that is ignorant, that contraries are the remedies of contraries? and that broken bones muſt be united by joyning them together? but how it muſt be performed and done, this is of Art and peculiar to a Chirurgeon, and not known to the vulgar. Which the Indications drawn from thoſe fountains we pointed at before, aboundantly teaches, which, as by certain limits of circumſtances, encompaſs the Indication which is taken from the Eſſence of the diſeaſe, leſt any ſhould think, we muſt truſt to that only. For there is ſome great and principall matter in it, but not all. For ſo the meaneſt of the common people is not ignorant, that the ſolution of continuity is to be cured by repairing that which is loſt. But in what parts we may hope for reſtitution of the loſt ſubſtance, and in which not, is the part of a skilfull Chirurgeon to know and pronounce. Wherefore he will not vainly beſtow his labour

We do not alwayes follow the Indication which is from the diſeaſe.

In what parts we cannot hope for reſtoring of ſolution of continuity

labor to cure the nervous part of the *Diaphragma*, or Midriffe being wounded, or the Heart, ſmall Guts, Lungs, Liver, Stomach, Brain or Bladder; and that I may ſpeak in a word, Empericks are not much more skilfull than the common people, although they do ſo much extoll themſelves above others by the name of experience. For although experience be another inſtrument to find out things with reaſon, yet without reaſon, it will never teach, what the ſubſtance of the part in which the diſeaſe lies, may be; or what the action, uſe, ſite, connexion, from whence ſpeciall and proper Indications are drawn; With which the Chirurgeon being provided and inſtructed ſhall not only know by what means to find out a remedy, but alſo, leſt he may ſeem to mock any with vain promiſes, he ſhall diſcern what diſeaſes are uncurable, and therefore not to be medled withall.

Experience without reaſon is like a blind man without a guide.

Indications in implicit diſeaſes.

But implicit or intricate diſeaſes require each to be cured in their ſeverall order, except ſome one of them be deſperate, or ſo urge & preſs that the Phyſitian think it neceſſary after prepoſterous order, to begin with it, although often he be forced to make ſome one of theſe diſeaſes incurable, or give occaſion of cauſing ſome new one: into which ſtraits we are neceſſarily compelled to fall, when, (for example) we determine to pull, or take away ſome extraneous body; for the performance whereof we are compelled to inlarge the wound. So we are forced by neceſſity to open the neck of the bladder, (that ſo we may draw forth the ſtone therein contained) with a wound which often degenerates into an uncurable Fiſtula. For that diſeaſe which threatens danger of preſent death is of ſuch moment, that to ſhun that it may be counted a ſmall matter, and commodious for the ſick to bring in other diſeaſes, though uncurable. For if a convulſion happen by pricking a Nerve, which we cannot heal by any remedies, then by cutting the Nerve aſunder we end the convulſion, but deprive the part into which that Nerve did goe, of the uſe of ſome voluntary motion. So if in any great joynt there happen a Luxation with a wound, becauſe there is danger of convulſion by trying to reſtore and ſet right the luxated part, we are forc'd for ſhunning thereof, to attend the wound only, and in the mean time to let alone the Luxation. Otherwiſe in implicit diſeaſes if there be nothing which may urge, or call us from the ordinary cure, we muſt obſerve this order, that beginning with that affect, which hinders the cure of the principall diſeaſe, we proſecute the reſt in the ſame and their proper order, untill all the diſeaſes being overcome we ſhall reſtore the part affected to its integrity. Therefore let us take for an example, an ulcer in the Leg, a *Varix* (or big ſwollen vein) and a Phlegmonous tumor round about it; and laſtly, a body wholly plethorick and filled with ill humors; order and reaſon require this, that uſing the adviſe of ſome learned Phyſitian we preſcribe a convenient diet, and by what means we may, bring him to an equality by purging and blood-letting, and then we will ſcarifie in divers places the part where it is moſt ſwollen, then preſently apply Leeches, that ſo we may free it from the burden of the conjunct matter; then uſe Cauteries to help the corruption of the bone, and in the mean time change the circular figure of the ulcer into an ovall, or triangular; then at the length we will undertake the cutting of the *Varix*, and cure the ulcer which remains according to Art, and ſo at the length cicatrize it. In all this whole time the Patient ſhall neither walk, nor ſtand, nor ſit, but ly quietly, having his Leg orderly and decently rowled up. But if (as it often happens) the temper of the hurt part, be different from the temper of the whole body, the manner of curing muſt be ſo tempered, that we increaſe the doſis of hot or cold medicines, according to the ratable proportion of the indications requiring this or that, therefore imagine the part ulcerated to be ſuch, as that it is two degrees dryer than the juſt temper; but the whole body to exceed the ſame temper in one degree of humidity: reaſon and Art will require, that the medicin applyed to the ulcer be dryer by one degree than that which the part would otherwiſe require if it were temperate; but on the contrary let us ſuppoſe thus: the whole body to be one degree more moiſt then the temper requires, and the ulcerated part to be one degree dryer: truly in this caſe the medicine that is applyed to the ulcer by reaſon of the part it ſelf, ſhall not be increaſed in dryneſs, but wholly compoſed and tempered to the Indication of the ulcer, becauſe the force of the moiſture exceeding in the like degree, doth counterpoiſe the ſuperfluous degree of dryneſs. But it is more eaſie by an artificiall conjecture to determine of all ſuch things, than by any rules or precepts.

An example of Indications in implicit diſeaſes.

What we muſt do when the temper of the part is different from the temper of the whole body.

An artificiall conjecture is of much force in Indications.

To theſe ſo many and various Indications, I think good to add two other; the one from ſimilitude; the other of a certain crafty deviſe, & as the latter Phyſitians term it, of a certain ſubtile ſtratagem. We draw Indication from ſimilitude, in diſeaſes which newly ſpring up and ariſe, as which cannot be cured by Indications drawn from their contraries, as long as their Eſſence is unknown and hid; wherefore they think it neceſſary to cure them by a way and Art like thoſe diſeaſes, with which they ſeem to have an agreeing ſimilitude of Symptomes and Accidents; Our Anceſtors did the ſame in curing the French Pocks, at the firſt beginning thereof, as long as they aſſimilated the cure to that of the Leproſie, by reaſon of that affinity, which both the diſeaſes ſeem to have. But we follow crafty devices and ſubtile counſels, when the Eſſence of the diſeaſe we meet, with is wholly ſecret and hid, either becauſe it is altogether of a hidden and ſecret nature, and which cannot be unfolded by manifeſt qualities, or elſe reſides in a ſubject which is not ſufficiently known to us, nor of a phyſicall contemplation, as the Mind. For then we being deſtitute of Indications taken

Indication from ſimilitude.

Indication of a ſubtile device.

from

from the nature of the thing, are compelled to turn our cogitations to impostures and crafty counsels; and they say this Art and Craft is of chief use in Melancholy affects and fictions, which are often more monstrous and deformed than the *Chimera* so much mentioned in the fables of the Ancients; to which purpose, I will not think much to recite two Examples. A certain man troubled with a Melancholick disease, I know not by what errour of opinion, had strongly perswaded himself that he was without a head; the Physitians omitted no thing, by which they might hope to take this mad opinion out of his mind. But when they had in vain tryed all medicines, at length they devised this crafty, but profitable device; they fastened and put upon his head a most heavy helmet, that so by the pain and trouble of his head nodding and drawn down by that weight, he might be admonished of his error. Examples.

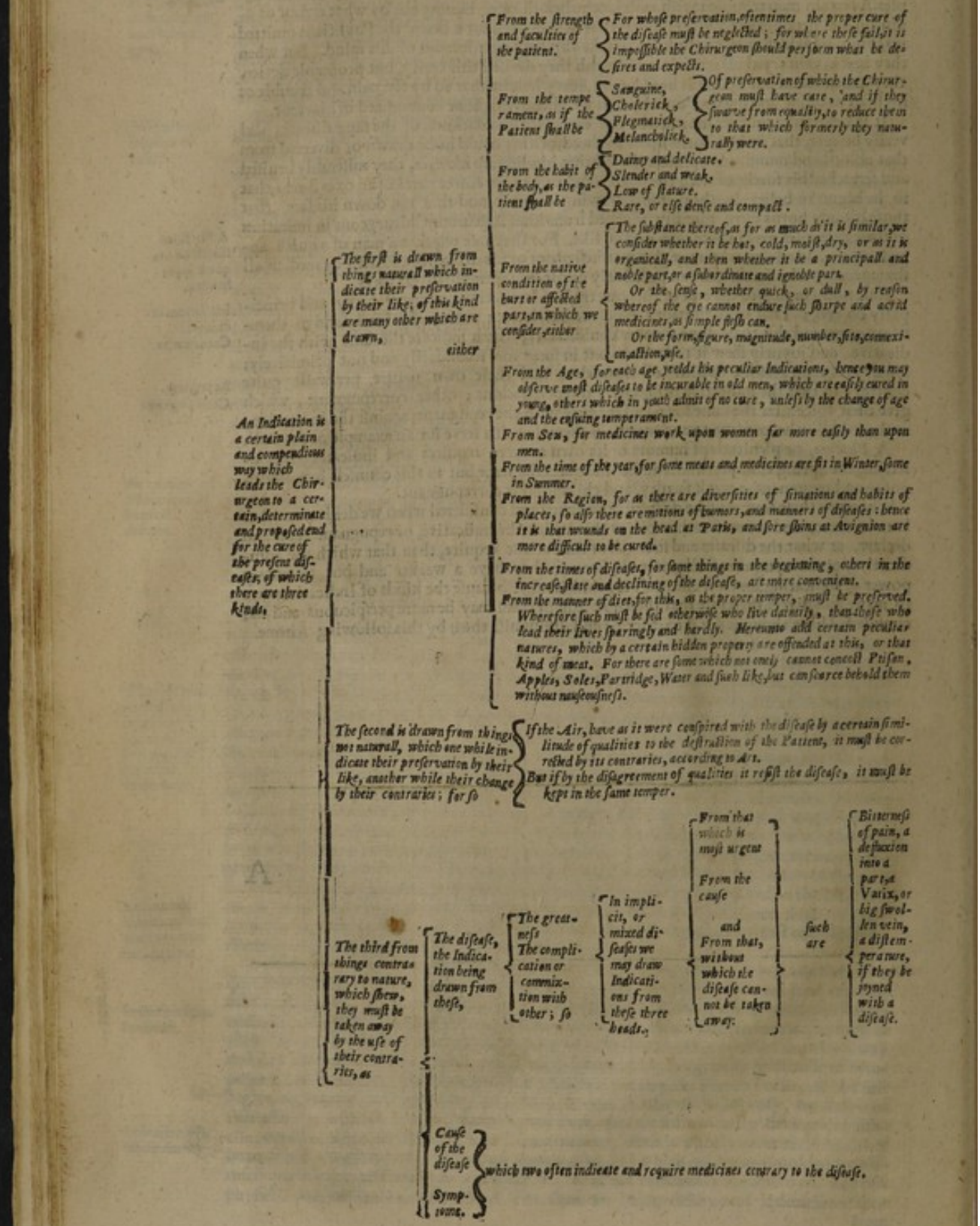
It is reported, another molested by the obscurity and darkness of the same disease, did verily beleeve, that he had horns upon his head; neither could he be drawn or diverted from that absurd and monstrous opinion, untill that binding up his eyes, they miserably bruised and scratched his forehead with the bony roughness of the lower parts of an oxes horns, that so he begun to believe by the painfull drawing of the blood that ran down his face, that those bloody horns were forcibly plucked from him. Ingenious Chirurgeons in imitation of these examples may in like cases do the like. For that case requires a man of a quick apprehension and advice, who may give manifest proof of his diligence and skill by medicinall stratagems, as who forthwith can politickly devise stratagems of divers sorts. A Physitian should be of a quick apprehension.

But, now coming to the end of this our tract of Indications, we must chiefly and principally observe; That of Indications some are Indicative; which absolutely and of themselves command this to be done; other conidicative, which indicate the same with the Indicative, and joyntly shew it to be done, but in some sort secondarily and not primitively; some are repugnant, which of themselves and their own nature perswade quite contrary to that the indicative primitively did perswade us; other correpugnant, which give their voice after the same form and manner with the repugnant against the indicative, as the coindicative consent to and maintain them. Let this serve for an example of them all. Indications indicative. Coindicative. Repugnant. Correpugnant.

A *Plethora*, or plenitude of humors of its own nature, requires and indicates bloodletting, the Spring time perswades and coIndicates the same, but to this counsell is quite opposite and repugnant, a weak faculty, and childhood is correpugnant.

Wherefore these four must be diligently weighed and considered when we deliberate what is to be done, and we must rather follow that which the indicative, or repugnant shew and declare, as what the diseases and strength of the Patient require, than that which the coindicative, or correpugnant shall perswade, because they have a weaker and but secundary power of indicating, and not essentiall & primitive. But because the kinds of Indications are so many and divers, therefore that the knowledg of them may be more perspicuous and less confused, I have thought good to describe and distinguish them by this following scheme.

A Table of Indications.



CHAP. XXIII.

Of certain wonderfull and extravagant ways of curing Diſeaſes.

Monſtrous diſeaſes.

AS monſters ſometimes happen in nature, ſo alſo in diſeaſes, and in the events and cures of diſeaſes. I underſtand by monſters certain marvailous ſucceſſes in diſeaſes, or certain ways of curing them, which ſwerve from Art, and happen beſides reaſon, nature, and common uſe.

The wonderfull force of the bite of a certain Spider.

Alexander ab Alexandro, and *Peter Gilius* tell, that in *Apulia* a part of *Italy* they have a certain kind of Spider very frequent; the natives call it *Tarantula*, *Petrus Rhodius* cals it *Phalangium*; The Inhabitants find theſe Spiders in the firſt heat of Summer ſo venenate and deadly, that whomſoever they touch with their virulent biting, he preſently, without he have ſpeedy remedy, deprived of all ſenſe and motion fals down, or certainly if he eſcape the danger of death, he leads the remnant of his life in madneſs. Experience hath found a remedy by Muſick for this ſo ſpeedy and deadly a diſeaſe: Wherefore as ſoon as they can they fetch Fidlers and Pipers of divers kinds, who by playing and piping may make muſick; at the hearing whereof, he which was fallen down by reaſon of the venemous bite, riſes cheerfully, and dances ſo long to their meaſures and tunes, untill by the painfull and continued ſhaking and agitation of the whole body, all the malignity is diſſipated by tranſpiration and ſweats.

Muſick the remedy thereof.

Alexander adds, that it happened once in his ſight, that the Muſicians their wind and hands failing them ceaſed playing, and then the Dancer preſently fell down as if he had been dead; but by and by the Muſick beginning anew, he riſe up again and continued his dancing till the perfect diſſipation of the venome. And that it hath happened beſides, that one not ſo perfectly healed, certain reliques of the diſeaſe yet remaining, when a long time after he heard by chance a noiſe of Muſicians, he preſently fell a leaping and dancing, neither could he be made to leave before he was perfectly cured.

Muſick gives eaſe to pain.

Some affirm according to the opinion of *Aſclepiades*, that ſuch as are frantick are much helped with a ſweet and muſicall harmony. *Theophraſtus* and *Aulus Gellius* ſay, that the pain of the Gout and Sciatica are taken away by Muſick. And the ſacred Scripture teſtifies, that *David* was wont by the ſweet ſound of the Harp to refreſh and eaſe king *Saul* when he was miſerably tormented by his evil ſpirit. *Herodotus* in *Clio* tels, that *Cræſus* the king of *Lydia* had a Son, which of a long time could not ſpeak, and when he came to mans eſtate was accounted dumb: but when an enemy with his drawn ſword invaded his father (overcome in a great fight, and the City being taken in which he was) not knowing that he was the King, the young man opened his mouth endevouring to cry out, and with that ſtriving and forcing of the Spirit, he broke the bonds and hinderances of his tongue, and ſpoke plainly and articulately, crying out to the enemy that he ſhould not kill King *Cræſus*. So both the enemy with-held his ſword, and the king had his life, and his ſon had his ſpeech always after. *Plutarch* in his book, Of the benefit to be received from our enemies, tels, That a *Theſſalian* called *Proteus*, had a certain inveterate and incurable Ulcer in a certain part of his body, which could not be healed, before he received a wound in a conflict in the ſame place, and by that means the cure being begun afreſh, the wound and ulcer were both healed.

A ſtrong perturbation of the mind helps by moving the ſpirits.

Chance ſometimes exceeds Art.

Quintus Fabius Maximus, as *Livie* writes, was long and very ſick of a quartain Ague, neither could have wiſhed ſucceſs from medicins adminiſtred according to Art, untill skirmiſhing with the *Allobroges*, he ſhaked off his old feaveriſh heat, by a new heat and ardent deſire of fighting. It was credibly reported to me of late by a Gentleman of the Lord of *Lanſackes* Chamber, that there was a French Gentleman in *Polonia*, who was grievouſly tormented with a quartain Feaver, who on a time walking upon the bank of the river *Wixell*, to take away the irkſomneſs of his fit, was thruſt in jeſt into the River by a friend of his that met him by chance, by which (although he could ſwim, as he alſo knew that thruſt him in) he conceived ſo great fear, that the Quartain never troubled him after. King *Henry* the ſecond commanded me to go from the Camp at *Amiens* to the City *Dorlan*, that I might cure thoſe that were hurt in the conflict with the Spaniards, the Captain *S. Arbin*, although at that time he had a fit of a Quartain ague, yet would he be preſent at the fight, in which being ſhot through the ſide of his neck with a Bullet, he was ſtrucken with ſuch a terror of death, that the heat of the Feaver was aſſwaged by the cold fear, and he afterwards lived freed from his Ague.

Obſerv. 4. lib. 2.

Franciſcus Valeriola the famous Phyſitian of *Arles*, tels, That *John Berlam* his fellow Citizen troubled with a Palſey of one ſide of his body for many years, his houſe taking fire, and the flame coming near the bed in which he lay, he ſtrucken with a great fear, ſuddenly raiſed himſelf with all the force he had, and preſently recovering the ſtrength of his body, leaps out at the window from the top of the houſe, and was preſently cured

cured of his diſeaſe, ſenſe and motion being reſtored to the part, ſo that afterward he went upright without any ſenſe of pain, who lay unmovable for many yeers before. He tells the like in the ſame place of his couſen *John Solitatius*; hee was a long time lame at *Avignion*, by reaſon that the Nerves of his hams were ſhrunk and drawn up, ſo that he could not go; being moved with a vehement and ſodain paſſion of anger againſt one of his ſervants whom hee endevoured to beat, he ſo ſtirred his body that forthwith the Nerves of his hams being diſtended and his knees made pliant he began to go and ſtand upright without any ſenſe of pain, when he had been crooked about the ſpace of ſix years before, and all his life after he remained ſound.

Cap ult. lib. de cur. rat per ſanguinis miſs.

Galen tels he was once fetched to ſtanch the bleeding, for one who had an Artery cut neer his Anckle, and that by his means he was cured without any danger of an *Aneurisma(i)* a relaxation of a veinous veſſell; and beſides by that accidentall wound he was freed from moſt grievous pain of his hip, with which he was tormented four yeers before: but although this eaſing of the pain of the Sciatica happened according to reaſon by the evacuation of the conjunct matter, by the artery of the anckle of the ſame ſide being opened; yet becauſe it was not cut for this purpoſe, but happened only by chance, I judged it was not much diſſenting from this argument.

Galen by a dream cures the *Sciatica*.

Pliny writes that there was one named *Phalereus*, which caſting up blood at his mouth, and at the length medicines nothing availing, being weary of his life, went unarmed in the front of the battell againſt the enemy, and there receiving a wound in his breaſt, ſhed a great quantity of blood, which gave an end to his ſpitting of blood, the wound being healed, and the vein which could not contain the blood being condenſate.

At *Paris*, *Anno* 1572. in *July*, a certain Gentleman being of a modeſt and curteous cariage fell into a continuall Feaver, and by that means became Frantick, moved with the violence of which he caſt himſelf headlong out of a window two ſtories high, and fell firſt upon the ſhoulder of *Vaterra* the Duke of *Alenzons* Phyſitian, and then upon the pavement; with which fall he cruelly bruiſed his ribs and hip, but was reſtored to his former judgment and reaſon. There were preſent with the Patient beſides *Valterra*, witneſſes of this accident theſe Phyſitians, *Alexis*, *Magnus*, *Duretus*, and *Martinus*. The ſame happened in the like diſeaſe, and by the like chance to a certain *Gaſcoyn* lying at the houſe of *Agrippa* in the Paved ſtreet.

Othomannus Doctor of Phyſick of *Mompelier* and the Kings Profeſſor, told me that a certain Carpenter at *Broquer* a village in *Switzerland*, being frantick caſt himſelf headlong out of an high window into a river, and being taken out of the water was preſently reſtored to his underſtanding.

The cauſe of the laſt recited cures.

But if we may convert caſualties into counſel and Art, I would not caſt the Patient headlong out of a window. But would rather caſt them ſodainly and thinking of no ſuch thing into a great ciſtern filled with cold water, with their heads foremoſt, neither would I take them out untill they had drunk a good quantity of water, that by that ſodain fall and ſtrong fear, the matter cauſing the Frenzy might be carryed from above downwards, from the noble parts to the ignoble; the poſſibility of which is manifeſt by the forecited examples, as alſo by the example of ſuch as bit by a mad Dog, fearing the water are often ducked into it to cure them.

CHAP. XXIV.

Of certain juggling and deceitfull wayes of Curing.

HEre I determine to treat of thoſe Impoſtors, who taking upon them the perſon of a Chirurgeon, do by any means either right or wrong, put themſelves upon the works of the Art; but they principally boaſt themſelves amongſt the ignorant common ſort, of ſetting bones which are out of joint and broken, affirming as falſly as impudently, that they have the knowledg of thoſe things from their Anceſtors; as by a certain hereditary right; which is a moſt ridiculous fiction; for our minds when we are born, is as a ſmooth table, upon which nothing is painted. Otherwiſe what need we take ſuch labour and pains to acquire and exerciſe ſciences? God hath endued all brute beaſts with an inbred knowledg of certain things neceſſary for to preſerve their life, more than man.

Sciences are not hereditary.

But, on the contrary he hath enriched him with a wit furniſhed with incredible celerity and judgment, by whoſe diligent and laborious agitation he ſubjects all things to his knowledg. For it is no more likely, that any man ſhould have skill in Chirurgery becauſe his father was a Chirurgeon, than that one who never endured ſweat, duſt nor Sun in the field, ſhould know how to ride and govern a great horſe, and know how to carry

carry away the credit in tilting, only becauſe he was begot by a Gentleman and one famous in the Art of War.

There is another ſort of Impoſtors far more pernicious and leſs ſufferable, boldly and inſolently promiſing to reſtore to their proper unity and ſeat, bones which are broken and out of joint, by the only murmuring of ſome conceited charms, ſo that they may but have the Patients name and his girdle. In which thing I cannot ſufficiently admire the idleneſs of our Country-men ſo eaſily crediting ſo great and pernicious an error; not obſerving the inviolable law of the ancient Phyſitians, and principally of Divine *Hippocrates*, by which it is determined, that three things are neceſſary to the ſetting of bones diſlocated and out of joynt; to draw the bones aſunder; to hold the bone receiving, firmly immoveable with a ſtrong and ſteddy hand; to put the bone to be received into the cavity of the receiving. For which purpoſe the diligence of the Ancients hath invented ſo many engines, Gloſſocomies and Bands, leſt that the hand ſhould not be ſufficient for that laborious work. What therefore is the madneſs of ſuch Impoſtors to undertake to do that by words, which can ſcarce be done by the ſtrong hands of ſo many Servants, and by many artificiall engines?

A moſt impudent ſort of Impoſtors.

Three things neceſſary for the cure of a Luxation.

Of late years another kind of Impoſture hath ſprung up in *Germany*, they beat into fine powder a ſtone which in their mother tongue they call *Bembruch*, and give it in drink to any who have a bone broken, or diſlocated, and affirm that it is ſufficient to cure them. Through the ſame *Germany* there wander other Impoſtors who bid to bring to them the Weapons with which any is hurt; they lay up in a ſecret place and free from noiſe, and put and apply medicines to it, as if they had the patient to dreſs, and in the mean time they ſuffer him to go about his buſineſs, and impudently affirm that the wound heals by little and little by reaſon of the medicine applyed to the weapon.

But it is not likely that a thing inanimate which is deſtitute of all manner of ſenſe, ſhould feel the effect of any medicine; and leſs probable by much, that the wounded party ſhould receive any benefit from thence. Neither if any ſhould let me ſee the truth of ſuch juggling by the events themſelves and my own eyes, would I therefore beleeve that it were done naturally and by reaſon, but rather by charms and Magick.

In the laſt aſſault of the Caſtle of *Hiſdin* the Lord of *Martigues* the elder was ſhot through the breaſt with a Musket bullet. I had him in cure together with the Phyſitians, and Chirurgeons of the Emperour *Charles* the fift and *Emanuel Philibert* the Duke of Savoy, who becauſe he entirely loved the wounded priſoner, cauſed an aſſembly of Phyſitians and Chirurgeons to conſult of the beſt means for his cure. They all were of one opinion, that the wound was deadly and incurable, becauſe it paſſed through the midſt of his lungs, and beſides had caſt forth a great quantity of knotted blood into the hollowneſs of his breſt.

There was found at that time a certain *Spaniard*, a notable Knave, and one of thoſe Impoſtors, who would pawn his life, that he would make him ſound; wherefore this Honorable Perſonage being in this deſperate caſe was committed unto his care. Firſt of all hee bid they ſhould give him the Patients ſhirt, which he tore into ſhreds and peeces, which preſently framing into a Croſs, he laid upon the wounds whiſpering ſome conceived or coined words, with a low murmure. For all other things he wiſhed the Patient to reſt content, and to uſe what diet he pleaſed, for he would do that for him, which truly he did. For he eat nothing but a few prunes, and drunk nothing but ſmall beer, yet for all this the wounded Prince died within two days; the *Spaniard* ſlipt away, and ſo ſcaped hanging. And whileſt I opened the body in the ſight of the Phyſitians and Chirurgeons to embalm him, the ſigns and accidents of the wound did evidently and plainly appear to be as we had pronounced before.

And there be alſo other Jugling companions of this tribe, who promiſe to cure all wounds with lint, or Tents, either dry, or macerated in oyl or water, and bound to the wound, having murmured over ſome charm or other, who have had ſometimes good ſucceſs, as I can witneſs. But the wounds upon which tryall was made were ſimple ones, which only required union, or cloſing for to perfect the cure. So verily the bones of beaſts when they be broke, grow together by the only benefit of nature. But when the affect ſhal be compound by diverſity of Symptomes, as a wound with an ulcer, inflammation, contuſion and fracture of a bone, you muſt hope for no other from Tents or Lints, nor charms than death. Therefore the common ſort who commit themſelves to theſe Impoſtors to be cured do not only injure themſelves, but alſo hurt the Common-wealth, and the common profit of the Citizens; for whoſe good and juſtice ſake a prudent Magiſtrate ought to deprive Impoſtors of all freedome in a free and Chriſtian commonweal.

What wounds may be cured only by lint, or by tents and Water.

Witches, Conjurers, Diviners, Soothſayers, Magicians, and ſuch like, boaſt of curing many diſeaſes; but if they do or perform any thing in this kind, they do it all by ſleights, ſubtilties and forbidden Arts, as Charms, Conjurations, Witcheries, Characters, Knots, Magicall Ligatures, Rings, Images, Poyſons, laces tyed acroſs, and other damnable tricks, with which they pollute, pervert and defame the prime and ſacred Art of

Phyſick, and that with the danger of mens lives. Who certainly are to be baniſhed by the laws of our Countrey, eſpecially ſeeing it is decreed in *Moſes* law, *Let none be found among you that uſeth witchcraft*, or a regarder of times, or a marker of the flying of Fowls, or a Sorcerer, or a Charmer, or that counſelleth with Spirits, or a Soothſayer, or that asketh counſell at the dead; for all that do ſuch things, are abomination to the Lord, and becauſe of theſe abominations the Lord thy God doth caſt them out before thee. But the Miracles of our Lord Jeſus Chriſt the Son of God, and of his Saints and Apoſtles in curing diſeaſes beyond nature and all Art, are of another kind, which we ought to beleeve ſo firmly and conſtantly, that it ſhould be counted an impiety for a Chriſtian to doubt of them. All holy Writings are full of theſe; as to give ſight to the blinde, hearing to the deaf, power to go to thoſe ſick of the Palſie, to drive forth Devils, to cure the Leproſie, to give fruitfulneſs to women, to raiſe the Dead, and perform by the holy Ghoſt other Miracles which exceed the condition and law of Nature; whom here we earneſtly intreat to free and protect us from unclean Devils, and the ſpirits of diabolicall deceit, and to give us the mind that we may will and be able always to aſpire to Heaven, and faſten the hope, ſafety, and anchor of all our fortunes in God alone. *Amen.*

Deut. 18.

The End of the firſt Book.

The second Book, OF LIVING CREATVRES, And of the Excellency of MAN.

BEfore I come to ſpeak of the Anatomy of Mans body, I have thought fit to ſay a little of the nature of brute Beaſts. There is between Beaſts a great deal of difference by nature; for of theſe, ſome are hardy and bold, others fearfull; ſome wilde and ſavage, others tame; ſome walking in herds, others wandring alone; ſome covered and defended with ſhels and ſcales, as the Crocodile, the Tortois, and many kinds of fiſh; others have ſtings and prickles. The difference of brute beaſts.

The Horſe hath his hard and ſtrong hoofs, his creſt (as being a generous beaſt) beſet with a thick and harſh mane. The defence of the magnanimous Lion, are his teeth, his crooked paws and tail. Buls are formidable by their horns. The Boar by his tusks ſtanding out, as it were naturall hunting ſpears. The Hare being a timerous creature, is naked and unarmed; but in recompence thereof Nature hath made her nimble and ſwift of foot. For what the more noble and courageous beaſts have in arms, is ſupplyed in the fearfull by nimbleneſs and celerity. Infinite are the other endowments of brute beaſts, and ſuch as can hardly he imagined or deſcribed. For if we diligently ſearch into their nature, we ſhall obſerve the impreſſions and ſhadows of many vertues, as of magnanimity, prudence, fortitude, clemency, and docility: for they entirely love one another, follow thoſe things that are good, ſhun thoſe that are hurtfull, and gather and lay up in ſtore thoſe things that are neceſſary for life and food. Laſtly, they give undoubted preſages of the weather and air. They have taught men many things, and are of a moſt exquiſit and quick ſenſe; of rare art in vocall muſick, prudent and carefull for their young, and faithfull lovers of their native ſoil. They are religiouſly obſervant of the rights of friendſhip and chaſtity. They have their weapons whereby they are prepared, both to invade, and to defend themſelves being invaded. They ſubmit themſelves to the diſcipline of man, practiſe and imitate his ſpeech, and mutually prattle and chant one to another. They have a kind of weal-publick amongſt themſelves, and know how to preſerve their preſent welfare, and to depell the contrary, being in this their own counſellors, and not tutored by man. Yea, man is beholden to them for the knowledg of many wholſome things. The conſideration of which bred ſo great a doubt amongſt the ancient Philoſophers, that it was a queſtion amongſt them, whether beaſts had uſe of reaſon, or no? Therefore alſo the wiſe *Solomon* ſends us for examples of parſimony and diligence unto the Ant or Piſmire; and *Eſaias* in exprobration of the people of Iſrael for their ingratitude and rebellion againſt God, ſends them to the Ox and Aſs; for they do not only know, but reverence their maſters. Some ſhadow of vertue in beaſts.

But from whence is the knowledg of theſe Medicins, wherewith the Art of Phyſick is ſo richly adorned, but from brute beaſts, as *Pliny* affirmeth? The infallible vertue of the herb *Diſtamus*, in drawing darts out of the fleſh, was taught us by the Hart, who wounded with the Huntſmans darts or arrows, by means hereof draws out the weapons which remain ſticking in her. Which is likewiſe practiſed by the Goats of *Candie*, as *Ariſtotle* writeth. The wonderfull effect which *Celandine* hath upon the ſight, was learnt by the practiſe of Swallows, who have been obſerved with it to have beſmeared, and ſo ſtrengthened the eys of their young. Serpents rub their ey-lids with fennell, and are thought by that means to quicken and reſtore the decaying ſight of their eys. The Tortois doth defend and ſtrengthen her ſelf againſt the biting of Vipers, by eating of ſavorie. Bears by eating of Piſmires, expell that poiſon that they have contracted by their uſe of Mandrakes. *Lib. 8. cap. 27.*

Mandrakes. And for correction of that drouzineſs and ſloth which growes upon them by their long ſleep in their dens, they eat the hearb of *Aron* (i.) Cuckopint. But the Art they uſe in the enticing and catching of Piſmires is very pretty, they go ſoftly to the holes or hils of the Piſmires, and there lay themſelves all their length upon the ground, as if they were dead, hanging out their tongue wet with their foam, which they draw not again into their mouth, before they feel them full of Piſmires, which are enticed by the ſweetneſs of the foam: And having taken this as a purging medicine, they expell by the guts, thoſe ill humors wherewith they were offended. We ſee that Dogs give themſelves a vomit, by eating a kind of graſs, which is from thence called Dog-graſs. Swine, when they find themſelves ſick, will hunt after ſmalt, or river lobſters. Stockdoves, Blackbirds, and Partridges, purge themſelves by Bay leaves. Pigeons, Turtles, and all ſort of Pullen, disburden themſelves of groſs humors, by taking of Pellitory of the wall. The bird Ibis (being not much unlike the Stork) taught us the uſe of Clyſters. For when he finds himſelf oppreſſed with a burden of hurtfull humors, he fills his bill with ſaltwater, and ſo purgeth himſelf by that part, by which the belly is beſt diſcharged. The invention of the way of removing the Cataract of the eye, we muſt yeeld unto the Goat, who by ſtriking by chance againſt the thorny buſhes, pulls off the Cataract which hinders the ſight, and covers the ball of the eye, and ſo recovers his ſight. The benefit of Phlebotomie, we owe unto the Hippotamus or River-horſe, being a kind of horſe, and the Inhabitant of the River *Nilus*; who being a great devourer, when he finds himſelf ſurcharged with a great deal of blood, doth by rubbing his thigh againſt the ſharp ſands on the bankſide, open a vein, whereby the ſuperfluous blood is diſcharged, which he ſtoppeth likewiſe when it is fit, by rowling himſelf in the thick mud. The Tortois having chanced to eat any of the fleſh of a Serpent, doth make origanum and marjoram her Antidote. The Ancients found help from brute beaſts, even againſt the dreadfull and non-ſparing force of lightning; for they were of opinion that the wings of an Eagle were never ſtruck with lightning, and therefore they put about their heads little wreaths of theſe feathers. They were perſwaded the ſame thing of the Seal, or Sea-calf, and therefore were wont to encompaſs their bodies with his skin, as a moſt certain ſafeguard againſt lightening. It were a thing too long, and laborious, to ſpeak of all thoſe other muniments of life and health (obſerved here and there by *Ariſtotle* and *Plinie*) which we have learnt of brute beaſts. I will therefore end this Chapter, after that I have firſt added this; That we are beholding to beaſts not only for the skill of curing diſeaſes, and of preſervation of health, but for our food, our rayment, and the ornament and beautifying the bodies.

The craftineſs of Bears.

The bird Ibis the firſt inventer, or ſhewer of Clyſters.

The invention of removing a Cataract.

The invention of Phlebotomy.

A preſervative againſt thunder.

Of the Faculty of brute Beaſts in preſaging.

THe firſt knowledg and skill of Prognoſtication, and obſervation of weather by the Air, was firſt delivered unto us from beaſts of the land and water, and from fowl. For we ſee in dayly obſervation, that it is a ſign of change of weather, when Lambs and Rams do butt at one another with their horns, and playing wantonly do kick, and keep up their heels. The ſame is thought to be preſaged when the Oxe licks himſelf againſt the hair, and on the ſodain fils the Air with his lowing, and ſmels to the ground, and when he feeds more greedily than he uſed to do. But if the Piſmires in great multitudes fetch their prey ſo haſtily, that they run and tumble one upon another in their narrow paths, it is thought a ſign of rain; As is alſo the buſie working of Moals, and the Cats rubbing and ſtroaking of her head and neck, and above her ears, with the bottome of her feet. Alſo when Fiſhes play and leap a little above the water, it is taken for a ſign of rain. But if the Dolphins do the ſame in the ſea, and in great companies, it is thought to preſage a ſodain ſtorm and tempeſt. Whereby the Mariners forewarned, uſe all care poſſible for the ſafety of themſelves and their ſhips, and if they can caſt Anchor. And it is ſufficiently known what the louder croaking of Frogs than ordinary portends.

What the butting of Rams ſignifies.

Preſages of rain.

The ſign at ſea of a ſtorm at hand.

But the facultie of birds in this kind of preſaging is wonderfull. If Cranes flie through the air without noiſe, it is a ſign of fair weather, and of the contrary, if they make a great noiſe and flie ſtragglingly. As alſo if Sea fowl flie far from the Sea, and light on the land. The cry or ſcrieching of Owls portends a change of the preſent weather, whether foul or fair. *Plutarch* ſaith, that the loud cawing of the Crow betokens winds and ſhowers, as alſo when he flaps his ſide with his wings. Geeſe and Ducks, when they dive much, and order, and prune, and pick their feathers with their beaks, and cry to one another, foretell rain; and in like manner Swallows, when they flie ſo low about the water, that they wet themſelves, and their Wings. And the Wren, when he is obſerved to ſing more ſweetly than uſuall, and to hop up and down. And the Cock when he chants, or rather crows preſently after the ſetting of the Sun. And Gnats, and fleas, when they bite more than ordinary. If the Hern ſoar aloft into the air, it betokeneth fair weather, if on the contrary he flie cloſe by the watter, rain. If Pigeons come late home to the Dove-houſe, it is a ſign of rain. If Bats flie in the evening, they foreſhew wet weather. And laſtly the Crocodile layes her egs in that place, which muſt be the bounds of the overflowing of the River *Nilus*; And therefore he that firſt meets with

The Crocodile by laying her egs, ſhews the bounds of the increaſe of the River *Nilus*.

with these eggs, tels the rest of the Countrey people, and shews them how high the flood will rise, and what inundation it will make upon their grounds: A thing most worthy of admiration, that in this monster there should be that strong faculty of presaging.

Of the industry of Fishes.

How Fishes provide for their safety against a storm.

MAny sea-Fishes, when they feel a tempest coming, do gravell or balast themselves, to the end they may not be tossed up and down at the pleasure of the waves. Others when the fury of the sea is at the height, hide themselves in the holes of rocks. But in that they swim against the stream, they do it for this cause and reason, that the force of the stream and the flood may not take from them, and strike off their scales, and that their gills may not fill with water which would hinder their swimming, and intercept their respiration. As by the same advice Cranes fly against the wind; whereas if they should fly down the wind, their feathers would be displaced and broken, and they would not be able to fly.

How they swim against the stream.

Of the industry of Birds in the building of their Nests.

Of what things birds build their nests.

THe industry of Birds in the building of their nests is such, that it doth far exceed the art and skill of all Masons and Architects. From whence it is become a Proverb, *That men know, and can do all things but make Birds-nests.* They are built within with wooll and feathers, and such kind of soft things, which are as a kind of a pallet for the young ones. Swallows build their nests in a round form, that they may be the more firm, and less subject to be hurt by any thing that shall strike against them, and likewise more capacious. They choose their matter out of dirt and chaff, (interlacing it with many straws) as it were their plaster or lime. Those that build in trees, do make choice of the soundest boughs, as if they meant to have them as a sure foundation for the building which they should erect thereon. The Cock and the Hen do by turns sit over their eggs, and likewise fetch their meat, interchanging each others labor; neither do they ever forsake their young, before they are able to get their own living. I had at my house a great number of Sparrows nests in earthen pots; and when the young ones begun to wax pretty big, and to be covered with feathers, I made the whole nest be taken down and set upon the ground, that I and my friends might delight our selves in beholding the care of the old ones in the feeding of their young; for they feed them every one in order, skipping none, neither will they (to the wrong of the rest) give one two parts, although he gape, and be importunate for it; dividing most justly to every one his own share, according to the exact rule of distribution. And oftentimes for experiment, I would make triall with a strange Sparrow of the same age, laid near, or put among the rest of the young ones, whether the old ones would feed the stranger, as if it were legitimate. But this as a stranger and a bastard they would suffer to starve, skipping it when it gaped after the meat. And in like manner Lambs and young Kidds do in the fields, in the midst of a great flock, run every one to his own dam; who being most certainly able to distinguish between the legitimate and a bastard, will not suffer her self to be suckt but by her own young.

In what shape.

With what care Sparrows feed their young.

Of the industry of Spiders.

How the Spiders weave.

THe Spider spins her web with wonderfull artifice, hanging and fastening it to every tack or stay that is nigh, drawing of his thread, and running upwards and downwards, and every way. And although the diligence of the chamber-maid beats down and mars this pendulous and new-begun work, yet her seat and her hold, the Spider keeps still, neither is she, or will she desist from the work she hath begun, but in a very short time weaves a great deal more unto the ruins of her former work, than can be unweaved again with much labor. So that from hence all cloth and linnen Weavers, all Embroiderers and workers with the needle (you will easily think) have learnt their Arts, if either you observe the exactness of the weaving, the fineness of the thred, or the continuation and indissoluble knitting together of the whole web; for being abrupt, and troubled with no ends of threds at all, it resembles a thin membrane, anointed with a kind of glew, wherewith, when the prey is entangled, the Spider runs presently in, and, as it were, draws her nets, and infolds, and takes the captive after the manner of huntsmen. If this were not daily seen with our eys, it would be thought fabulous.

How they catch their prey.

Of Bees.

Bees choose themselves a King.

I Cannot pass in silence the great industry of Bees: For having established a kind of Weal-publick, they make election of a King, who is such a one, as in procerity of body, and excellency of feature exceedeth all the rest. He is remarkable by his short wings, his streight legs, his grave gate; and in stead of a Diadem or regall Crown, either he hath no sting, or else doth not use it, which is the Artillery of the rest. He never goeth unattended out of the hive, but always invironed with a Princely retinue, the rest of his train following after neither goes he at any time abroad, but upon urgent affairs which concerns

concerns the whole ſtate. His progreſs is forewarned by the voice and ſound of trumpets, and as it were with ſinging, and they all draw nigh. Every one gets as near to his perſon as he can, and when he is weary with flying, they all bear him up with their own bodies.

Their pitching their tents.

On what place ſoever he alighteth, there they forthwith pitch their tents. If he chance to die, they go not abroad to feed, but ſtand all mourning round about the corpſe; then carry him out of the hive, and (as it were) follow his hearſe and bury him: and laſtly, having with ſolemnity performed all the ſeverall rites and obſequies, they chooſe themſelves another King, for without a King they cannot live. He then taketh care of all things, having his ey every where, whilſt that the reſt intend the performance of the work. And ſuperviſing all, giveth them encouragement, and chaſtiſeth negligence. For their time of going forth for food, they chooſe a clear and fair day; for they have a naturall faculty of preſaging of the weather. They are ſuch obſervers of juſtice and equity, that never, either with their ſting, or by any other way, do they moleſt any creature, neither do they exerciſe and prepare their ſpears againſt any, but for the ſafegard of themſelves and their hives.

Their obſequies for their dead King.

Their juſtice.

Of the care of Bees.

THey manage and order their affairs in this manner; in the day-time they appoint before their gates a ſtation of watchmen and guarders. In the night they reſt from their labors, ſo long, till that one (who is appointed to this charge) by one or two humms, as by a ſound of a Trumpet, rowſeth all the reſt. Then come they together to obſerve what is the ſtate of the weather, which if they foreſee will be fair, then abroad go they into the fields and paſtures. Some therefore bring into the hive little faſcicles of flowers on their thighs; others water in their mouth, and others a dewie moiſture gathered on their bodies. Theſe are met by others, who receive their burdens, which they diſpoſe in their due and proper places. Thoſe that are ſent out into the fields for food, are the youngeſt and the ſmalleſt; And therefore if the wind chance to riſe any thing high, they expect untill it ceaſe, and that the force and violence thereof be over. But if it continue violent, then do they ballaſt themſelves with a little ſtone flying cloſe by the ground, to prevent their being driven to and fro by the force of the wind. They are exceeding diligent in all their buſineſs, and do puniſh the ſloth of the lazie oftentimes with death. Some of them are the builders, others poliſh the building, and the reſt bring in their materials.

Their watch.

Their divers employments.

The building in their arched hives is with wonderfull artifice, being made with two doors, one to come in, and the other to go out at. They have all things alike, leſt that the inequality, either of their food or labor, ſhould give occaſion of diſſention. Their care is, that their houſes may ſhew both ſtate and handſomneſs. Idle drones, born for nothing but to eat, and conſume the fruits of their labors, they chaſe from their hives. Thoſe that chance to loſe their ſtings, are utterly diſabled, and in a ſhort time their guts come out that way, and they die. They bring to their owners wonderfull increaſe of wax and honey.

They puniſh ſloth with baniſhment.

Ariſtomachus the Philoſopher doth boaſt, that for fifty eight years together, he had with great care been a nouriſher of Bees, only that he might the better attain to the knowledg of their ſtate and condition.

Ariſtomachus a diligent obſerver of Bees.

Of Piſmires and Ants.

NEither truly is the induſtry, diligence, and experience of the Piſmire leſs worthy of admiration, than that of the Bees. Inſomuch as that *Solomon* bids the ſluggard to take an example of diligence from the Piſmire. Truly, if experience did not witneſs it, it would ſeem incredible, that ſo ſmall a creature ſhould be able to ſtore up ſuch abundance of corn, to diſpoſe and manage her affairs in that good order that we ſee ſhe doth. *Pliny* ſaith, that they have among them the form of a wel-govern'd and wel-order'd Common-weal. For how pretty a ſight is it to ſee them, when they ſeiſe upon a grain they have a mind to carry away, how they ſet to it, and lift it with head and ſhoulders. And how leſt the corn which they carry to their ſtore-houſe, ſhould put forth and grow, they bite it at one end. If it be ſo bigg that they cannot carry it into their little hole, they divide it in the middle. If it be dampiſh, they lay it out to dry in the Sun and open air. When the Moon is at the full, they follow their work in the night; when ſhe doth not ſhine, they take their reſt, whereby they ſhew themſelves to have ſome knowledg of heavenly things. *Pliny* affirmeth that they have their ſet Fairs and Markets, whither they come in great companies, and where they uſe to eſtabliſh leagues of amity and friendſhip one with another. And when one marks them well, would he not think that they were in conference one with another, and that they did diſcourſe among themſelves of their buſineſs? Do we not ſee that the often trampling of their little feet doth wear a path even upon hard flint ſtones?

Lib. 11. & 30.

Wonderfull care.

There is nothing but may be attained by diligence.

From whence we may note, what in all kind of things is the effect of aſſiduity. They ſay alſo that they perform the rites of buriall one unto another, after the manner of men.

What

What words ſhall I uſe (ſaith *Plutarch*) to expreſs ſufficiently the diligence and induſtry of the Piſmires? There is not among all the great things in nature, a ſight of greater wonder than theſe: For in the Piſmires are ſeen the marks of all vertue. Their great meetings argue that they maintain a kinde of friendſhip.

Their alacrity in the undergoing of their labors, ſeems to ſhew their fortitude and magnanimity; and laſtly, they are eminent examples of temperance, providence, and juſtice. Their mutuall charity appeareth in this, that if one of them that is not loaden meets another, (in one of their narrow paths) that is, he will give him the way, that he may the better go on in his intended journey. They ſay that the firſt entrance into their hole, is not ſtreight, but full of many diverticles and crooked paths, which all end, which will bring you to three little cels; in one of which they have their conventicles; in the other, they lay up their proviſions; and in the third they bury the carkaſſes of their dead. This doth *Plutarch* ſpeak concerning Piſmires.

The forms of all vertues expreſt in Piſmires.

Of Silk-Worms.

WIth the induſtry of theſe creatures, I ſhall not unfitly joyn that of the Silk-worms, of whoſe pains and care, both in the making of their neſts, and the ſpinning of their thred and bottoms (wherewith Kings are ſo magnificently adorned) Philoſophers have written very ſtrange things.

And who can chuſe but wonder at thoſe great endowments of skill and knowledg, and that exceeding induſtry, (the mother of ſo much wealth) in the little body of ſo ſmall a creature? The providence therefore of God, doth not only appear in this, that he hath adorned each creature with a peculiar and proper endowment, but in this eſpecially, that on the leaſt creatures of all, he hath beſtowed the greater portion of skill, induſtry, and ingenuity to ſupply their defect of bodily ſtrength.

Diligence the mother of wealth.

Of the love of Beaſts one towards another, and to their young.

PLutarch writeth, That all kind of creatures bear a ſingular love, and have a kind of care of thoſe that are generated of them, and the induſtry of the Partridges this way is much commended; for during the time that their young ones are weak and unable to fly, they teach them to lye upon their backs, and to hide themſelves among the clods on the ground, that ſo being almoſt of the ſame colour, they may not be diſcerned by the Faulkoner. But if notwithſtanding, they ſee any body coming, and that he is near them, they do with a hundred dodges and ſtoopings of themſelves, as if they were weary with flying, entice him away from their young to follow after them, and when they have their purpoſe, they then, as if they had recovered ſome freſh ſtrength, fly quite away; who can but wonder at this both affection and ſubtilty?

The induſtry of Partridg in preſerving their young.

In *Florida* part of the *Weſt-Indies*, they have a beaſt, which for the variety and deformity of it I cannot paſs over in ſilence; the natives call it *Succarath*, the Canibals, *Su.*

It keeps for the moſt part about the rivers, and the ſea-ſhore, and lives by prey. When he perceiveth that he is purſued by the Huntſman, he gets his young ones upon his back, and with his tail, which is very long and broad, he covereth them, and ſo flying, provideth both

both for his own and their ſafety; neither can he be taken by any other way but by pits, which thoſe ſavage men uſe to dig in the places near which he is to run, into which at unawares he tumbles headlong. This picture of him here, I drew out of *Thevets* Coſmographie.

Tom. 2. lib. 23. cap. 1.

How Hares provide for themſelves and their young, for feat of hunters.

Neither are thoſe things leſs wonderfull that are reported of Hares, for when they would go to their feat, they ſever their young, and commit them to the truſt of divers places, it may be two acres aſunder one from another, leſt peradventure a Huntſman, a dog, or any man ſhould chance to come that way, and they might be in danger to be loſt at once. And then after they have traced up and down, hither and thither, and every way that the dogs may not trace them, nor the huntſman prick them, they take a leap or two, and leap into their forms.

Nor inferior to this is the craft of the Hedghog, for when the Fox purſueth him, and is now at his heels, he rowls himſelf up in his prickles like a cheſnut in the outward ſhell, ſo that every part being rounded and encompaſſed with theſe ſharp and dangerous pricks, he cannot be hurt: and ſo ſaves himſelf by this trick. For his young he provides in this manner:

The care of the Hedghog to provide for her young.

In the time of Vintage he goes to the vines, and there with his feet he ſtrikes off the boughs and the grapes, and then rowling his body makes them ſtick upon his prickles, and ſo doth (as it were) take his burthen upon his back, and then returns to his hole; you would think that the grapes did move of themſelves; the prey he divides between himſelf and his young.

Of the affection of Birds, and of Dogs towards their Maſters.

The piety of Storks.

THe young Stork provides for the old, which is diſabled by age; and if any one of their equals come to any miſchance, that he is not able to fly, they will give him their aſſiſtance, and bear him on their backs and wings. And therefore this affection and piety towards the old ones, and (as it were) brotherly love towards their equals, is commended in the Stork.

The Hen in any kind of danger gathers her chickens under her wings, and (as it were) with that guard, defends them as well as ſhe can. For their ſake ſhe expoſeth her ſelf to the cruelty of the fierceſt beaſts; and will fly in the eys of a Dog, a Wolf, or a Bear, that by chance offers to meddle with her chickens.

The fidelity of Dogs.

But who is there that doth not admire the fidelity and love of dogs towards their Maſters, whereby they recompence them for their keeping? A Dog will never forſake his Maſter, no, if he be never ſo hardly uſed. For there is no man can find a ſtick hard enough to drive that Dog clean away from him which hath once taken a love to him. There is no kind of creature that doth more certainly and readily remember his maſter; he will know the voice of all the houſhold, and of thoſe which frequent the houſe. There cannot be a truſtier keeper, (as *Cicero* himſelf ſaith) than a Dog is; I ſpeak not of their faculty of ſmelling, whereby they follow their Maſters by the foot, and find them, neither do I ſpeak of thoſe infinit examples of the fidelity of Dogs, which were too long to rehearſe.

Doves free from adultery.

Pigeons, as well the cock as the hen, although they are all very venereous, yet they know no adultery; yea, and the Hen will bear with the frowardneſs of the cock, neither will ſhe ever leave him, but reconciling him unto her by her officious diligence, bring him to his wonted dalliance and kiſſes, neither is the love of either of them leſs towards their young.

Turtles never couple twice.

There is the like mutuall bond of love between Turtles; for if one of them die, the ſurviver never ſolicits Hymen more, neither will he ever chuſe other feat than a dry withered bough.

Of the ſtrength, piety, docility, clemency, chaſtity, and gratitude of Elephants.

AMong the beaſts of the field, there is none more vaſt, more ſtrong, or more to be feared than the Elephant. His ſtrength is ſufficiently ſhown by thoſe towred Caſtles of armed men which he carries, and fiercely ruſheth with into the battail. The *Roman* ſouldiers, being otherwiſe of undaunted ſpirits, yet in that battail which they fought againſt *Pyrrhus*, being terrified with the vaſtneſs and immanity of theſe bodies, which they had never before ſeen, preſently turned their backs and fled; which notwithſtanding, it is a wonderfull thing what Stories naturall Philoſophers tell of the vertues of the Elephant.

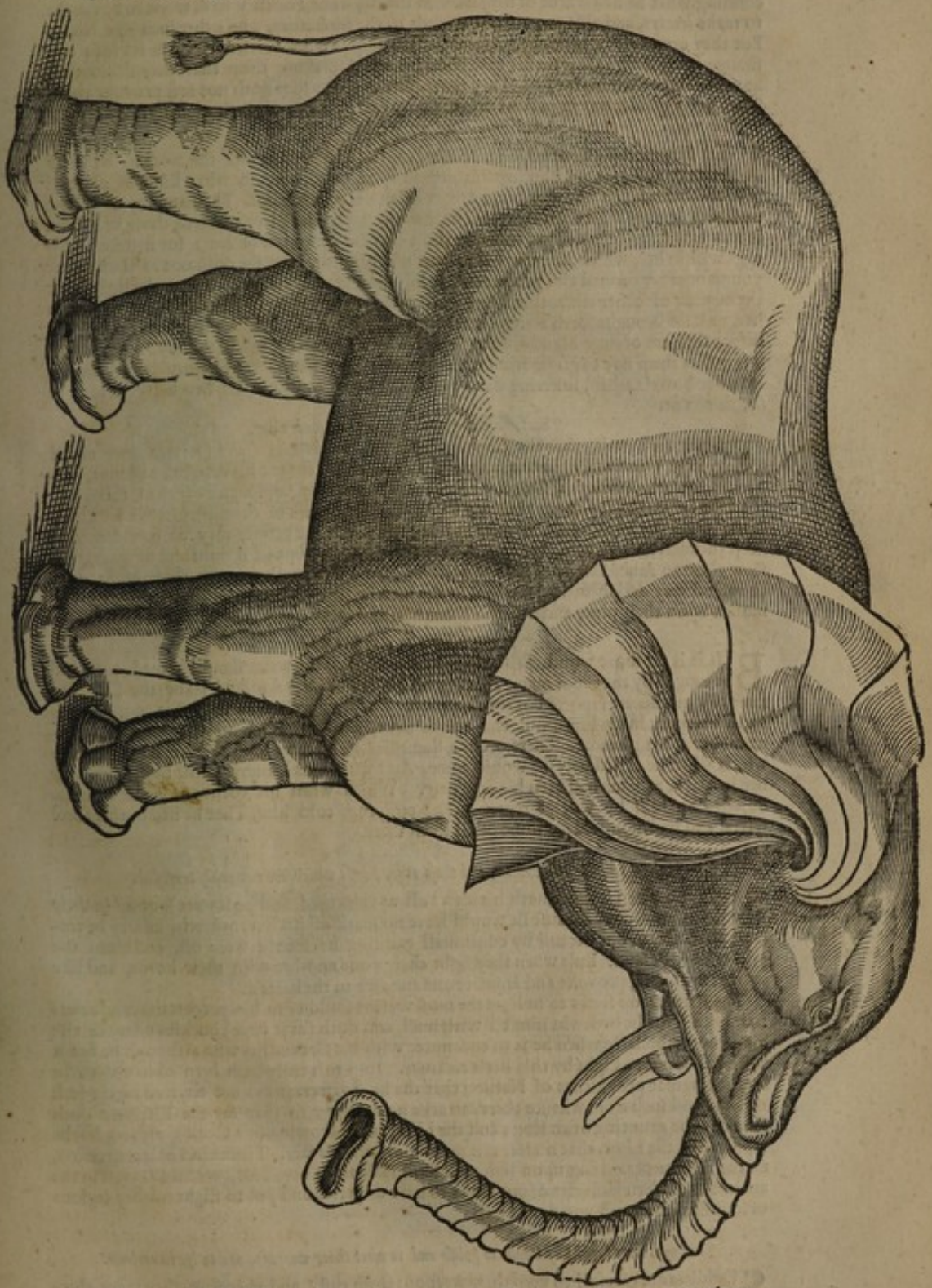
Lib. 8. cap. 1.

Plinie writeth, that an Elephant cometh very near to the underſtanding that men have, and that he hath a rude kind of knowledg of language; that his facility and obſequiouſneſs is wonderfull, that his memory in the performance of his wonted duties, is no leſs wonderfull. And for Religion (*Plutarch* ſaith) that they pray unto the gods, and ſprinkle and purge themſelves with ſalt water, and that with great reverence they worſhip the Sun at his riſing, lifting their trunks up towards heaven for want of hands. *Plinie* addeth, that they do with the like reverence worſhip the Moon and the Stars. For it it related in,

The religion of the Elephant.

the

the Hiſtories of the *Arabians*, that at a new Moon the Elephants go by troops down unto the rivers, and there waſh themſelves with water; and being thus purged, kneel down and worſhip the Moon, and then return to the woods, the eldeſt going firſt, and the other following after according to their age.



Plutarch reporteth, that it hapned once, that among the Elephants which were taught at *Rome*

Rome againſt the Panegyrick ſhews, there was one that was ſomething dull, and not ſo docile as the reſt, which made him be deſpiſed by his fellows, and often beaten by his maſter. But that this Elephant, that he might ſupply by diligence what he wanted in wit, was oftentimes obſerved in the night, by the light of the Moon, to be practiſing and conning what he had learnt of his maſter in the day-time. For they were wont to be taught to make letters, and alſo to preſent garlands to the ſpectators, and other ſuch like tricks. But they can never be brought to go aboard a ſhip, to be carried over the ſea into any ſtrange land, unleſs their maſter give them his word to aſſure them that they ſhall return again to their own native ſoil. They never hurt any one that doth not firſt provoke them. They never gender but in private out of ſight, an argument of their modeſty.

Plin. lib. 8. cap. 5.

Of the Lamprey.

LEſt that the heat of affection may ſeem to lie quenched under the waters, let us by one example, (it were an infinit thing to ſpeak of all) ſee in what kind of mutuall love the creatures of the water come ſhort of thoſe of the land. The Lamprey of all the creatures of this kind doth worthily bear the praiſe for its piety towards thoſe of whom it was generated, its affection towards thoſe that are generated of her; for firſt ſhe breeds eggs within her, which in a ſhort time after are ſpawned. But ſhe doth not as ſoon as her young ones are formed and procreated, bring them ſtraight-way forth into the light after the manner of other fiſhes, that bring forth their young alive, but nouriſheth two within her, as if ſhe brought forth twice, and had a ſecond brood. Theſe ſhe doth not put forth before they are of ſome bigneſs, then ſhe teacheth them to ſwim and to play in the water, but ſuffers them not to go far from her; and anon gapes and receives them by her mouth into her bowels again, ſuffering them to inhabit there, and to feed in her belly ſo long as ſhe thinks fit.

The ſavage or brute beaſts may be made tame.

Coſmograph. Tom. 2. lib. 19. cap. 7.

THevet reporteth, that the Emperor of the Turks hath at *Caire* (it was once called *Memphis*) and at *Conſtantinople*, many ſavage beaſts kept for his delight, as Lions, Tigers, Leopards, Antilopes, Camels, Elephants, Porcupines, and many other of this kind. Theſe they uſe to lead about the City to ſhew. The maſters of them are girt with a girdle hung about with little bels, that by noiſe of theſe bels the people may be forewarned to keep themſelves from being hurt by theſe beaſts. But in hope of reward and of gifts, they ſhew them to Ambaſſadors of ſtrange nations, before whom they make theſe beaſts do a thouſand very delightfull tricks, and in the interim they play their countrey tunes and muſick upon their pipes and other inſtruments, and make many ſports in hope of gain.

That Fiſhes alſo may be tamed.

BUt it is far more wonderfull, that the creatures of the water ſhould be made tame, and be taught by the art of man. Among which, the chiefeſt are held to be the Eel. The ſame things alſo are reported of the Lamprey. For we have it recorded, that *Marcus Craſſus* had a Lamprey in his Fiſh-pool, that was ſo tame, and ſo well taught, that he could command her at his pleaſure. Therefore as a domeſticall and tame beaſt he gave her a name, by which when he called her, ſhe would come. And when this Lamprey died, he mourned for her in black, as if ſhe had been his daughter. Which when his colleague *Cneus Domitius* objected to him by way of reproach, he replying, told him, That he had buried three wives, and had mourned for none of all them three.

Of the Lion, the Ichneumon, and thoſe other beaſts which are not eaſily terrified.

The providence of the Lion in his going.

THe Lion when he goes, hath his claws always clutched, and (as it were) put up in their ſheaths, not only becauſe he would leave no mark of his feet, whereby he may be traced and ſo taken, but becauſe by continuall walking he ſhould wear off, and blunt the points of his claws. Buls when they fight charge one another with their horns, and like valiant ſouldiers, provoke and animate one another to the battail.

The greateſt are terrified by the leaſt.

The Ichneumon ſeems to imitate the moſt valiant ſouldier in his preparation and acceſs to battail; for he bedawbs himſelf with mud, and doth (as it were) buckle and make tite his armor, eſpecially when he is to encounter with the Crocodile; who although he bee a vaſt beaſt, is put to flight by this little creature. And this truly hath been obſerved to be by the ſingular providence of Nature, that the moſt vaſt creatures are terrified by the leaſt things, and ſuch from whence there can ariſe no danger; ſo they ſay the Elephant doth ſtartle at the grunting of an Hog; and the Lion, at the crowing of a Cock; although it be reported of the Lion, that no fear can make him turn his face. Theſe kind of fears, terrors, and affrightments, ariſing upon light and moſt ridiculous occaſions, we find as well in the ancient as modern Hiſtories of our times, to have diſperſed and put to flight mighty legions of ſouldiers, and moſt potent armies.

That men were taught by Beaſts to poliſh and to whet their weapons, and to lye in ambuſh.

SOuldiers are carefull to keep their weapons from ruſt, and therefore they carry them to the Armorers to be poliſhed. But in this care, many beaſts are nothing inferior unto

to them; for Boars whet their tusks against they fight. And the Elephant knowing that one of his teeth is doubled with digging at the roots of trees to get meat, keepeth the other sharp, and touches nothing with it, preserving it for his combat with the *Rhinoceros* his

The craft of the Rhinocerot about to fight with the Elephant.

enemy; but the craft of the Rhinocerot is very remarkable, that being in continuall enmity with the Elephant, at the time when he prepares for the battail, he whets his horn against a rock, as if it were with a whetstone; nor (if he can chuse) will he strike any other part of the Elephant but the belly, because he knows that part of the Elephant is so tender, that it may be easily pierced. This beast is in length equall to the Elephant, but in height he is inferior unto him, by reason of the shortness of his feet; he is of a palish yellow colour, and full of many spots.

Of Cocks.

Cocks are kingly and martiall Birds.

COcks are kingly Birds, and therefore Nature hath adorned them with a comb, as with a princely Diadem; and whersoever they come, their magnanimity and courage makes them kings. They fight with their beaks and their spurs, and with their martiall voice they fright the Lion, who is otherwise the king of beasts.

Of Conies.

Conies have taught us undermining.

COnies have taught us the art of Undermining the earth, whereby the most lofty Cities and structures reaching the very skies, are by taking away their foundation levelled with the ground.

Marcus Varro writes, that in Spain there was a town, and that no mean one, which standing on a sandie ground, was so undermined by a company of Conies, that all the houses tumbling and falling down to the ground, the inhabitants were fain to depart aud seek new dwellings.

Of Wolves.

The deceits and ambushes of Wolves.

MEn have learnt the arts of waging War from the Wolves, for they come out by troops, and lye in ambush near the towns which they have appointed, and then one of them runs unto the town and provokes the dogs. And making as if he run away, incites the Dogs to follow him, untill he hath gotten them unto the place where their ambush lyeth, which on a sodain appeareth, and rusheth out upon them. And so they kill and eat all, or as many of the dogs as they are able to catch.

Of the Fox.

The craft of the Fox.

IN subtilty and craft the Fox exceedeth all other beasts: when in the chase the Dogs are at his heels, he berays and bepisses his tail, and swings it in the face and eys of the Dogs that follow him, and so blinding them, in the mean time gets ground of them. To fetch the Hens down from their pearch, he hath this devise, he shakes and swings his tail upwards and downwards, as if he meant to throw it at them; which they fearing tumble down, and he takes up one of them for his prey. His warinesse when he passeth over a River that is frozen, is wonderfull; for he goes softly to the bank, and lays his ear to listen, if he can hear the noise of the water running under the ice. For if he can, back he goes, and will not venture to pass over. The knowledg of which thing he could never meerly by his subtilty and craft attain unto, but that of necessity he must have some faculty of reasoning joined with it; which by discourse, and by proving one thing by another, arrives at this Conclusion: whatsoever is liquid and maketh a noise, is in motion; whatsoever liquid is in motion, is not concrete and frozen; that which is not concrete and frozen, is liquid; whatsoever is liquid, will not bear a heavier body; whatsoever will not bear a heavier body, cannot with safety be adventured on; and therefore back again must I go, and not pass over this River.

The Fox seems to reason with himself.

His *Sorites.*

Of Swine.

SWine, if in the woods, they hear any one of the same herd with them crying out, they straight make a stand; and marshalling their forces, haste all, as if they had been warned by the sound of a martiall trumpet, to the assistance of their fellows.

Of the fishes Scarus *and* Anthia.

The love of Fishes one to another.

PLutarch reports of the *Scari*, that when one of them chances to swallow a hook, and be taken, the rest of the same kind come to his rescue, and shearing the Line with their teeth, set him at liberty. But the readinesse of the *Anthia* to the mutuall assistance of one another, is yet more manifest; for by casting the Line upon which the hook hangeth on their back, with the sharpnese of their fins they cut it asunder, and so set free themselves and their captived fellows.

Of the Pilot-*fish.*

THere is great kindnes between the Pilot-fish and the Whale; For although in bulk of body the Whale so far exceed him, yet he leads the Whale, and goes always before him

him as his Pilot, to keep him from running himself into any straight or muddy place, whence he might not easily get out. And therefore the Whale always follows him, and very willingly suffers himself to be led by him, it being for his own good. And in like manner he gets into the Whales mouth, and there lodging himself, sleeps when he sleeps, and leaves him not either by day or night.

The Whales pilot or guide.

Of Cranes.

CRanes when they are to take a long journey into some Countrey cross the seas, put their company in so good order, that no Captain can put his souldiers in better. For before they stir out of any place, they have (as it were) their trumpets to call them together, and encourage them to fly. They come together, and then fly up on high, that they may see afar off, choosing a Captain whom they are to follow. They have their Serjeants to take care of their ranks, and keep their nightly watches by turns. *Plutarch* tels us that the Crane, which is appointed to stand Sentinell for all the rest, holds a stone in her foot, to the end, that if she chance to give way to nature and sleep, she may be waked by the noise of the falling stone. The leader lifting up his head, and stretching out his long neck, looks about him far and wide, and gives warning to the rest, of any danger that may befall them. The strongest lead the way, that they may the better with the flapping of their wings break the force of the air, and this they do by turns. And that they may the easilyer prevail against the force and opposition of the winds, they dispose their company into a wedg in the form of the Greek letter Δ or a triangle; and being skilfull in the stars, they foresee when tempests are coming, and fly down to the ground to keep themselves from the injury of the approaching storm.

Cranes order themselves in ranks.

The sentinell Crane.

Of Geese.

THe Geese of *Sicilie* do with great wariness take care, that by their keeking and their noise, they do not expose themselves to the rapacity of Birds of prey: for *Plutarch* saith, that when they are to fly over the hill *Taurus*, for fear of the Eagles that are there, they hold stones in their mouths to keep themselves from gagling, untill that they come unto a place where they may be secure.

The care of the Geese that their gagling do them no harm.

Of Dragons.

NEither are the Dragons less crafty; for thus do they overcome those vast and otherwise invincible beasts the Elephants. They lye in ambush, and sodainly set upon the Elephants where they fear no such matter, and involve their legs with the twines of their tail, in such sort, that they are not able to go forward; and stop their nostrils with their heads, so that they cannot fetch their breath, they pull out their eys, and wheresoever they find the skin most tender, there they bite and suck the blood untill they make them fall down dead. *Pliny* saith, that there are Dragons found in *Æthiopia* of ten Cubits long, but that in *India* there are Dragons of an hundred foot long, that fly so high, that they fetch Birds, and take their prey even from the midst of the clouds.

The craft of Dragons fighting against the Elephant.

Lib 8. *cap.* 11. & 12.

Of the Fish called the Fisherman.

THis fish is called the Fisherman, because he hunts and takes other Fishes, which he doth almost by the same cunning which the Cuttell uses; for he hath hanging at his throat a certain bag, like the Wattels of a Turky-cock. This when he listeth he casteth out, and layeth before the little Fishes for a bait, and then by little and little draws it up again, untill he catch for food the little Fishes seising upon it as a prey.

The craft of the Fisherman-fish in taking her prey.

Of the Cuttell Fish.

WOnderfull is the craft of the Cuttell-fishes, for they carry a bladder at their neck full of a black juice or ink, which they pour forth as soon as they feel themselves taken; that so they may blind the eys of the Fishermen, as *Plutarch* saith, and as *Aristotle* witnesseth, they with their long fangs do not only hunt and take little Fishes, but oftentimes also Mullets.

The craft of the Cuttell to save her self. *Lib.* 9. *de Hist. animal. cap.* 37.

Of the arms or weapons of brute Beasts.

BRute beasts are naturally so furnished with arms, that they have no need to get, make or borrow in any other place.

And some of them nevertheless are so furnished with such arms, that they captivate those which hold them prisoners; an example of this is the *Torpedo*, which doth not only hurt by touch, but also by the net being between, he breaths such a quality from him, as stupifies the hands of the Fishermen, so that they are forced to let go their nets, and so let him go; moreover if it touch a ship it makes it stay. *Thevet* writes, that the *Persian* bay towards *Arabia*, nourishes a fish equal in length and thickness to a Carp, on every

Cosmogr. Nou. l. lib. 10. *cap.* 10.

side encompassed with sharp and strong pricks, like our Porcupine, with which he fights against all kinds of fish. If a man chance but to be lightly hurt either with these or his teeth, he will die within 24 hours.

Of the fish Utelif.

HE saith moreover, That as he was carryed by force of tempest through the Atlantick Ocean, he saw this fish, having (as it were) a Saw in his forehead of three foot long, and four fingers broad, armed on each side with sharp spikes; they call it *Utelif* in their Countrey speech.

Of the fish Caspilly.

THere is another fish to be seen in the Arabian-gulf, which the Arabians call Caspilly, it's two foot long, and as many broad, it hath a skin not much unlike a Dogfish, but armed with spikes, one whereof he carries in his forehead a foot and half broad, in sharpness and force of cutting not much short of a graver or chissell: with this weapon, when she is oppress with hunger, she assails the first fish she meets, neither doth she give over, before she carry her as a prey whither she please, as *Thevet* saith he hath seen.

Tom. 1. lib. 5. cap. 2.

Of Crabs.

CRabs and Lobsters, though in the quantity of their body they be but small, yet they use their forked claws before, not only in feeding but also in defending themselves and assailing others.

Of the docility of Beasts, and first of the Dog.

BEasts are apt to learn those things which men desire, whereby they shew themselves not wholly void of reason. For Dogs, Apes, and Horses learn to creep through the Juglers hoops, and rise on their hinder feet, as though they would dance. *Plutarch* tels, that a Jugler had a Dog which would represent many things upon the stage befitting the occasion and argument of the Play; amongst the rest, he exceeded all admiration in that, that taking a sopotifick medicin, he excellently feigned himself dead; for first, as taken with a giddiness in his head he begun to tremble, then presently fell down, and lying on the ground, as it were contracted his dying members, and lastly, as if truly dead he wax'd stiff; and moreover suffered himself diversly to be fitted according to divers parts of the Theater, the fable so requiring. But when he, by those things that were said and done, knew it was time to rise, he first begun to move his legs by little and little, as if he had been wakened from a sound sleep; then presently with his head a little lifted up, he looked this way and that way, to the great admiration of all the beholders; and finally rise up and went familiarly and chearfully to him he should; the which sight the Emperor *Vespasian* (who was then present in *Marcellus* his Theater) never saw any which more delighted him.

The wonderfull docility of Dogs.

A spectacle full of admiration and truth.

Of the Ape.

AN Ape is a ridiculous Creature, and which makes men much sport in imitating their actions. There hath been seen an Ape which would pipe and sing, and besides dance and write, and endevour to perform many other things proper to men. I remember I saw in the Duke of *Somes* house a great and curst Ape, who because he much troubled many, had his hands cut off, who suffering himself to be cured, when the wound was cicatrized, he grew more milde and docile. Wherefore cloathed in a green coat, and girt over his loins with a girdle, he carried hanging thereat a case of spectacles, a pair of knives, and a childs handkerchief. He was committed to the charge of the Master-cook to teach, because he had taken up his lodging in the Chimney-corner, he was taught many tricks and feats. If at any time he swerved from his doctrine and precepts, in a trice the whip was upon his back and loins, and much was abated of his daily allowance; for as *Persius* saith, The belly is the Master of Arts, and sharpener of wit. By these means he profited so in a short time, that he much exceeded all the Apes of his time in the glory of his wit; and there was none counted more skilfull in leaping and dancing to the pipe, running up a pole, and nimbly leaping through his Masters legs. To conclude, he performed all the actions of a strong Ape, and very reverently carried up dishes with the waiters and serving-men, and made clean the dishes and platters by licking, and did much other drudgery, so that he was commonly called, Master *John Do-all*. At dinner and supper sitting in a chair, he said grace, and cast his eys up towards heaven, and rouled them this way and that way, and smote his breast with the stumps of his hands with much lamentation, and imitated prayer by the gnashing or beating together of his teeth. He would turn up his tail to any that offended him, (for his coat scarce covered half his buttocks lest he should have filed it) he made much other pastime, always going upright by reason of the cutting away of his hands, unless at any time through weariness he were forced to sit on his buttocks.

Gal. lib. 1. de usu partium.

Of

Of the Camels.

THe *Camell* is a very domeſticall and gentle beaſt, and which is eaſily tamed and taught all kind of obedience and ſervice; although ſome of them are cruel, wilde and

trouble-

Camels both tame and wilde.

troublesome by biting and striking such as they meet, no less than untamed horses. There is no need to house them in the night, for they may be left in the plain fields in the open and free air, feeding upon the grass and trees and cropping the tops of the thistles, neither in the morning do they any whit the worse undergoe or carry their burdens. They

The ease and not chargeable keeping of Camels.

are not put to carry burdens before they be four year old. The *Arabians* geld them young, that they may enjoy their labour the longer, neither being gelt do they rage for love or desire of Venery. At the putting in of the Spring they endure hunger and thirst for eight dayes; they are so dutifull, that at the beck of the Turkish slaves, or but touched on the

Camels know when they have a sufficient load.

neck with a twig, they presently kneel on the ground to take up their burden, neither do they lift themselves up before that they find they have a sufficient load laid upon them. Those that have but one bunch upon their back are of *Africk*; but such as have two bunches are of *Asia*, or *Scythia*. Those kind of Camels that are the bigger are used to carry packs,

Camels both to carry burdens, and to ride upon.

but the lesser are used to ride upon, as our horses are. They love nothing so well as beans, and yet they live content with four handfuls of beans for a day. The greatest wealth of the *Arabians* consists in Camels, and so they estimate their riches, not by the quantity of silver, or gold, but by the number of Camels. The *Turkish* Emperour (*Thevet* being the reporter) made a Captain over the heards of his Camels, giving him a great troop of *African* and Christian slaves, that they might be the better looked unto. I have heard it reported (saith *Thevet*) by certain *Arabian*, *African* and *Jewish* Merchants who were present, at that time when *Sultan Selim* the first of that name, besieged *Caire* in *Ægypt*, (which in

A mighty troop of Camels.

former times was called *Memphis*) that there then was in that Emperors army sixty thousand Camels, besides a mighty company of Mules.

Of ravenous Birds.

The diligence of Falconers in training up their Hawks.

BUt let us take a view of Falconers teaching ravenous Birds, how with swift wings carried aloft into the air, they may seise upon other Birds, and cast them down dead to the ground; in performance whereof, they often too freely soare up to the clouds, so that they carry themselves out of the Falconers sight, with a desire to sun themselves, neglecting in the mean time their designed prey.

The fight of the Hern and Falcon.

The Hern when she sees her self kept under and below the Falcon carried up by his strong wings with a marvailous swiftness, with her beak, which is long and sharp, hid under her wings, and turned upwards, she receives the Falcon blinded with the heat of fight and desire of prey, carelesly flying down and rushing upon him; so that he often strikes him through the gorge, so that oft times they both fall down dead to the ground. But if the Falcon without harm escape the deceits by art, and the happy turning of his body, and the Hern be not cast down, the Faulconer calling her back with never so loud a voice, yet by setting up her Feathers she dares her to the pretended fight.

That Birds have taught us musicall tunes.

To sing like a Nightingale.

THe Nightingales are sweet and excellent singers, tuning their notes with infinite quaverings, and diversities of sounds, so prettily and sweetly, that humane industry can scarce equal the sweetness thereof, by so many musicall instruments; so that we say, he sings like a Nightingale, who varies his voice with much variety. In which thing Birds much excell men, because they have that admirable sweetness of singing from nature it self without any labor of learning; which men can scarce attain to in any school of musick, by having their ears a thousand times pluckt by the hand of a curst master.

That Beasts know one anothers voice.

The voice to beasts is of the same use, as speech is to men.

BEasts know one another by their voice, so that they may seem to talk and to laugh together, whilst flattering with their ears, they pluck in their noses with a pleasant aspect of their eys; and as speech is given to men, so Birds have their naturall voice, which is of the same use to them, as speech is to us. For all Birds of the same species, as men of the same countrey, chant and chirp to one another, when men understand not the speech of other men, unless of the same Nation. Wherefore the Scythian tongue is no more profitable to one living in Egypt, than if he were dumb; nor the Egyptians understand it no more than if they were deaf. Wherefore an Egyptian is dumb and deaf to a Scythian. This those which travail well understand how many dangers, how many troubles they undergo, because they cannot express their minds, and require things necessary for life. Wherefore to the assistance of this unprofitable tongue, we are compelled to call the rest of the members, and to abuse the gestures of the head, eys, hands, and feet. Truly the condition of brute beasts is not so miserable, seeing that all of the same kind whersoever they be, may answer each other with a known voice. Truly if any should hear a German, Briton, Spaniard, Englishman, Polonian, and Greek, speaking amongst themselves in their native tongues, not understanding any of them, he could scarce discern, and certainly judg, whether he heard the voice of men or of beasts.

We are as ill as deaf, when we hear an unknown language.

That

That Birds may counterfeit Mans voice.

Parrats are wonderfull imitaters of mans voice.

LInets, Larks, Pies, Rooks, Daws, Crows, Stares, and other such like Birds, speak, sing, whistle, and imitate the voices of men, and other creatures. In this Parrats excell all other, being wondrous skilfull imitaters of mens voices, and very merry, but specially when they have drunk a little wine.

A talking Pie.

Plutarch reports that there was a Barber at *Rome*, who kept a Pie in his shop, which spoke exceeding well, and that of her own accord, none teaching her, when she first heard men talking together, shee imitated the voice or cry of all beasts shee heard, as also the sound of Drums, and the sound of Pipes, and Trumpets; to conclude, there was nothing which she did not indevour to imitate. There have been Crows that have spoken and articulately sung songs and Psalmes, and that of some length. To which purpose the History of *Macrobius* is notable; for he tels that there was one amongst those, who went forth for luck sake to meet with *Augustus Cæsar*, returning from the war against *Antonius*, who carried a Crow, which he had taught plainly to pronounce this salutation, *Salve Cæsar Imperator Augustissime*, that is, *God save thee, O most sacred Emperor Cæsar.* *Cæsar* taken with the novelty of this spectacle, bought this obsequious bird with a thousand peeces of silver. *Pliny* and *Valerius* have reckoned up amongst prodigies, Oxen and Asses that have spoken. I omit infinit other things recorded by the ancients, *Plato*, *Aristotle*, *Pliny*, *Plutarch*, and other Philosophers of great credit, of the docility of beasts, and their admirable felicity of understanding. Which things, if untrue, these learned men would never have recorded in writing, lest so they might brand with vanity, (then which nothing is more base) the rest of their writings to posterity in all ensuing ages.

Lib 2. Saturn. cap. 4.

Of the Sympathy and Antipathy of Living Creatures amongst themselves.

HAving briefly described the understanding of brute beasts, it seems not impertinent to set down some things more worthy of knowledg, happening unto them by reason of Sympathy and Antipathy; that is, mutuall agreement and disagreement, which happens not only to them living, but also dead, by a certain hidden property, through occasion whereof some desire, other shun, and others prosecute one another even to death. In testimony whereof; The *Lyon* the King of Beasts excelling all other in courage and magnanimity, fears the Cock, for he is not only terrified by his presence, but also by his crowing being absent. So an Elephant fears a Hog; but he is so afraid of Mice and Rats, that he will not touch the meat that is given him, if he smell that it hath been defiled with such creatures. There is deadly hatred between the Elephant and Rhinocerot; yet when the Elephant is furious and angry, he becomes quiet and calm at the sight of a Ram. A Horse is so afraid of a Camel, that he cannot indure his sight. The Dog hates the Wolf, the Hart flies the Dog. The Snake flies from and fears a naked man, and followes him being clothed. There is deadly hatred between the Aspis and Ichneumon, for he when he hath rowled himself in the clay, dries himself in the Sun, and so being covered over (by doing thus divers times) as it were with shells, or armour, he enters into combat, stretching out his tail, and presenting his back, untill he get opportunity to choak his adversary, by leaping and fastening on her jaws, by which stratagem he also kils the Crocodile. The green Lizard is a capitall enemy to the Serpent, but most friendly to man, as *Erasmus* witnesseth by many Histories concerning that matter, in his Dialogue of Sympathy and Antipathy. There is a great deal of hatred between a Man and a Wolf, which is most manifest by this, that if the Wolves first see a man, his voice is taken away, and his intended cry hindered. If the Weasell intend to set upon the Aspis that most venemous Serpent, shee arms her self by eating Rue, as a most certain Antidote. The Ape fears the Torpedo, as *Erasmus* manifests by a pleasant history in the forementioned Dialogue; where also he prettily shews the deadly hatred between the serpent called Areus and the toad. The like hate is between the Owl and Crows, so that the Owl dares not go out, fly abroad, or seek her food unless by night. The water or River fowl are afraid of the Falcon; that if they but hear her bells, they had rather be killed with staves and stones, than take wing to flie into the air. So the Lark yeelds herself to be taken by a man, lest shee fall into the talons of the Hobby. The Castrill, or Merlin is naturally a terror to Hauks, so that they both shun his voice and presence.

The Lion fears a cock.

A horse fears a Camell.

With foul fear the Falcon.

The Kites are all at perpetual enmity with the Crows, wherefore the Crow alwayes gets away the Kites provision. All kind of Pullen fear the Fox. The Chicken fears neither a Horse, or an Elephant, but scarce hatched, it presently runs away at the voice or sight of a Kite, and hides it self under the hens wings. The Lambe and Kid flie from the Wolf when they first see him, neither doth death give an end to that hatred, but it supervives their funerall. An Experiment whereof (they say) is, that if one Drum be headed with Wolves skins and another with Sheeps, and beaten up together, you shall scarce hear the sound of the Drum covered with sheeps skins. And besides, if you string one Harp with strings made of sheeps guts, and another with strings of Wolves guts, you cannot bring

The enemity between the Kites and Crows.

The discord between the Lamb and Wolf is not ended by death.

it

it to paſs, by any art, to make them agree and go in one tune. It is reported from the experiments of many men, that if a Wolves head be hanged up on high in the place where Sheep are, that they will not touch the graſs how good and freſh ſoever it be, nor reſt quiet in any place, but tumultuouſly run up and down, untill all ſuch kind of terror be taken away. The hate betwixt Mice and Weaſels appears by this, that if you mix never ſo little of the brains of a Weaſell in the rennet, with which you crudle you Cheeſe, the Mice will never gnaw or touch that cheeſe. The Linnet doth ſo hate the bird *Florus*, that both their bloods put into one veſſel cannot be mixed together. A Wolves head hung up in a dove-houſe, drives away Poll-Cats and Weaſels. The Panther and Hyæna burn with ſo great hatred, that if both their skins be laid one againſt the other, the Panthers will ſhed the hair, the hairs of the Hyæna remaining entire and not moved; which thing, they ſay, happens to the feathers of other birds if any one chance to tye them up in a bundle with the Eagles. Let theſe ſuffice for ſome few examples of many, of the Antipathy amongſt beaſts. But of the Sympathy and conſent of beaſts amongſt themſelves, I think needleſs to write any thing, being it is ſufficiently known to all, that one Jay aſſociates another, and the cruel Bears agree amongſt themſelves; and beaſts of the ſame ſpecies do wonderfully conſent one with another.

How to make cheeſe that Mice will not gnaw.

That Man excells all beaſts.

I Now think it fit to aſſay to write of that excellency of man over beaſts, which I have ſo long intended. Neither would I that Epicures and other too much naturall and materiate Philoſophers, ſo take thoſe things I have written of the endowments of beaſts, as though we ſhould think, there were no difference between man and beaſt. I had no ſuch meaning, no ſuch intention; but only that man ſhould not become too ſtately, or too ingrate in leſs acknowledging God to be the Author of ſo many benefits with which he abounds. For whatſoever we have largely ſpoken of beaſts, yet there is no compariſon between beaſts and man, for there is too great a difference between them. For mans mind is adorned with religion, juſtice, prudence, magnanimity, faith, piety, modeſty, clemency, fortitude, and other vertues as lights, which ſhine much more bright in man than in beaſts. For they are ſometimes all in ſome one man, each whereof are thought great in beaſts. For ſeeing that man is made to the Image of God, it cannot be, how much ſoever he defile himſelf with the pollution of vices, that he can ſo obſcure that inbred light, but that alwaies ſome beam of the divine wiſdome will be inherent & ſhine in him. But although by collation to ſome beaſts, he may ſeem a defective and weak Creature; yet no fortitude nor ſtrength of beaſts can be ſo great as to equall the fortitude of man. For God hath ingraven in man the character of his divine vertue, by the aſſiſtance whereof, he might have all beaſts under and obedient to him. And though by that we have formerly ſaid, beaſts may ſeem to have a certain ſhadow of reaſon, yet that ſmall light is not fit for many and divers uſes, but there is only given them ſo much providence, as ſhould be ſufficient for them and the preſervation of their bodies. But men have reaſon given them to crop or gather the fruits of eternall life, (as *Lactantius* ſaith) whereby it comes to paſs, that man only, amongſt ſo many creatures, hath ſenſe and underſtanding of divine things. Which *Cicero* thought to be known by that, becauſe man only had a certain knowledg of God in his mind. Wherefore he was inriched by God with reaſon, ſpeech and hands as helps for the performance of all his actions; moreover by his ſingular and almoſt divine wit he eaſily excels all brute beaſts. For firſt, reaſon being his guide, he invented things neceſſary for life, fitly impoſed names on the things invented beſitting their natures, framed letters and Characters, invented all liberall Arts and handy-crafts, and found means to meaſure the Land and Sea. He hath obſerved and drawn into an Art the ſpaces of the Celeſtiall Globe, the diſtinctions of the Stars, the changes and orders of dayes and nights, of times and ſeaſons, the riſing and ſetting of Stars, and their power and effects over theſe lower bodies. Laſtly, he records in writing to perpetuall memory that which concerns his own nature, or the nature of other things, the precepts and ordinances of life and manners: by which ſingular gift, we can now confer with *Socrates*, *Plato*, *Ariſtotle*, and other Philoſophers of ancient times, as if they were living.

Mans bears Gods image.

Man hath given names to things.

What benefit man hath by reaſon of his native nakedneſs and ignorance.

BUt as Mans body is by nature naked and unarmed, ſo is his mind like a ſmooth table in which nothing is painted, nothing graven; but for help of his nakedneſs he hath hands, and for ſupply of his ignorance, reaſon and ſpeech. And by theſe three being as it were the miniſters of infinite variety of things, he clothes and defends his body with all things needfull: and inriches his mind with the knowledg of Arts and Sciences. Now if he had certain weapons born with him, he ſhould uſe them only; if he ſhould be born skilfull in any Art, he would meddle with none elſe. Therefore becauſe it was more expedient to uſe all ſorts of weapons with the hand, and be skilfull in all Arts; therefore he muſt be born wanting and ignorant of all. *Ariſtotle* very wittily called the hand the inſtrument of inſtruments: in imitation of which ſpeech, one may rightly affirm, that reaſon is the

Gal. cap. 4. lib. 1. de fa partium.

As the hand is the inſtrument of inſtruments ſo reaſon is the art of arts.

Art

Art of Arts: for as the hand in worth exceeds the other instruments, because it can make, handle and fit them for use; so reason and speech, though names of no Art, yet comprehend and encrease all Arts. Therefore man seeing he hath his mind instructed by Art, that is, by reason; it is fit he should have his body defended with a weapon, or instrument, that is, the hand, which in agility and excellency should excell all other instruments. For so Man hath of his hands in stead of all weapons, which he may use in war and peace as the instruments of all Arts; he wants not the Buls horns, the Boars tuskes, the horses hoofs, nor to conclude, any arms of any other Beast. For by the benefit of his hands he can handle other arms far more profitable and safe; as a Lance, Sword, Spear, halberd; but man also can use at some distance the bow, sling and handgun, when the horn and the hoof cannot be used but neer at hand. But some may say; A Lyon exceeds a man in swiftness of foot; what then? is man therefore inferiour to him? no, for by the means of his hands and the guidance of his reason he bridling and riding upon a horse, out runs the Lyon, and being victor follows him to and again as he himself pleases, or vanquished flies away, and from the horses back as from a tower wounds the Lyon with what weapons he pleases. To conclude, man is aboundantly provided with means, to defend himself from the violence of all other beasts. For this purpose he doth not only harness himself as with brasen wals, but also makes ditches and Bulwarkes, he makes by the ministery of his hands all kind of weapons, weaves himself garments, casts into the water and draws forth nets to catch fish; and to conclude, he performs all things to his own contentment, and having that priviledge granted him by God, he rules over all the earth; all things which lye hid in the bowels of the earth, which go, or creep upon the earth, which swim in the Sea, and flie through the air, or are any where shut up in the compass of the skie, are in mans dominion.

Man under God is the king and Emperour of the world.

How wonderfull God hath shewed himself in making man.

GOds Deity and providence hath principally shewed it self in the creation of man; neither his so admired light hath so shone in the production of other creatures, seeing that God would have them to live and have their being, only for mans sake, that they might serve him. Therefore man is, if we diligently consider all his endowments, a certain pattern and rule of the divine majesty and (if I may so say) Artifice. For being made to Gods image, he is as it were his coin, exceeding the capacity of all humane understanding. Which seemed a just reason to the ancient Philosophers, that he should be called *Microcosmos*, or a little world, because the particles of all things contained in the compass of heaven and earth, are contained in his mind and body, that in the mean time I may in silence pass over his soul more great and noble than the whole world.

Man is the end of all mundane things.

Man a little world, yea almost a great world.

Why Nature hath not given Man the faculty of presaging.

THis seems the reason, that men by the instinct of nature do not foresee the future seasons & dispositions of the heaven & air; because, seeing they have received certain sparks of prudence from God, by whose care and guidance they are led to the knowledg of things by no deceitfull but certain judgment, being not obnoxious to the conditions and changes of times and seasons, as beasts are. Wherefore knowing all these airy changes to be placed under them, that is to say, their minds, according as occasion serves, and their minds desire, they give themselves to mirth when the air is wet, stormy and dark, and on the contrary, in a clear and fair season, to a sincere and grave meditation of things sublime and ful of doubt. But beasts accommodating themselves to that disposition of the air which is present and at hand, are lively, or sad, not from any judgment as men, but according to the temper and complexion of their bodies following the inclinations of the air, and of the humors one while diffused, another while contracted. Neither ought we to blame man, because he can imitate the voice of beasts, but rather much commend him, that he can infinitely wrest and vary one thing, that is, his voice; for men can barke like Foxes and dogs; grunt like hogs; whet and grind their teeth like boars; roare like Lyons; bellow like bulls; neigh like horses; knack their teeth like Apes; houl like Wolves; bray like Asses; bleat like goats and Sheep; mourn like Bears, Pigeons, and Turtles; Keeke and gaggle like geese; hiss like Serpents; cry like Storks; caw like a Crow, and crow like Cock; clock like hens; chatter as Swallows and Pies; sing like Nightingales; croak like Frogs; imitate the singing of Waspes, and Humming of Bees; mew like Cats. The singing of Birds scarce seems to merit the name of Musicall, compared to the harmony of men fitted and tuned with infinit variety of voices. For with this they possess the ears of Kings and Princes; provoke and temper their wrath, and carry mens minds beyond themselves, and transforme them into what habits they please. But if those cruell beasts have any humanity, they owe it all to man. For he tames Lyons, Elephants, Bears, Tigers, Leopards, Panthers, and such other like.

Man is not obnoxious to the air and flats.

One man will counterfeit the voices of infinite varieties of beasts.

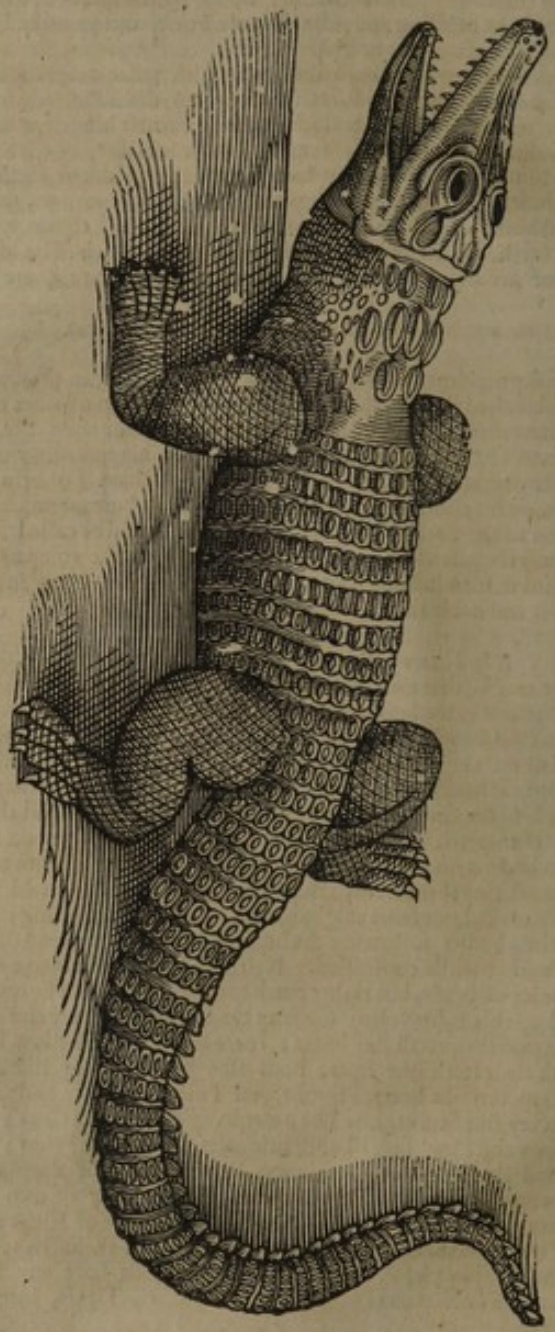
The power of Musick.

Of

Of the Crocodile.

A tame Crocodile.

PLutarch reports of the Crocodile (whose figure is delineated) that being tamed, and taught by man, he doth not only hear mans voice, and answers to his call, but suffers himself to be handled, and opening his throat, lets his teeth be scratched and wiped with a towell. How small a part of Physick is that, which beasts are taught by nature? Certainly nothing in comparison of man, who by the study and practise of a few years can learn at his fingers ends all the parts of Physick: and practise them not only for his own, but also for the common good of all men. But why cannot beasts attain unto the know-



ledg of Physick so well as men? I think, because so great an Art as Physick is, cannot be attained unto by the dull capacities of Beasts.

But

But for that I have written of the Religion of Elephants, if I muſt ſpeak according to the truth of the matter, we cannot ſay they worſhip God, or have any ſenſe of the divine Majeſty. For how can they have any knowledge of ſublime things or of God, ſeeing they wholly following their food, know not how to meditate on celeſtiall things? Now for that they behold and turn themſelves to the Moon by night, and to the Sun in the morning, they do not that as worſhipping, or for that they conceive any excellency or divinity in the Sun; but becauſe nature ſo requiring and leading them, they feel their bodies to rejoyce in that light, and their entralls and humors to move and ſtir them to it. Therefore when we attributed religion to Elephants, we ſaid it rather popularly, than truly, and more that we might exhort men to the worſhip of God, than that we thought Elephants had any knowledg of divine worſhip implanted in their minds.

In what ſenſe we ſaid Elephants had religion.

That man may attain unto the knowledg of all voices and tongues.

THe docility of mans wit is ſo great, and facility of the body obeying that divine gift of wit ſuch, that he is not only able to learn to underſtand and ſpeak the tongues of divers nations differing in ſo many peculiar languages; and not only to imitate and counterfeit the voices of all beaſts though ſo much different from man, which many flattering and jugling companions, followers of other mens tables, will do; but alſo may be able to know and underſtand both what they pretend and ſignifie. In confirmation of which thing they cite the Philoſopher *Apollonius* moſt famous in this kind of ſtudy and knowledg. He walking on a time amongſt a company of his friends through the field, and ſeeing a Sparrow come flying and chirping much to divers other Sparrows ſitting upon a tree, is reported to have ſaid to thoſe which were with him: That bird which came flying hither, told the other in her language, that an Aſs laded with corn was fallen down at the City gate, and had ſhed the wheat upon the ground. Wherefore *Apollonius* and all his friends which minds were with him went thither to ſee whether it were ſo, and found that it was ſo, as he had told them, and obſerved that the Sparrows moved thereto by the coming of the other, were eating up the grains of Corn ſhed on the ground.

Man not only the imitater, but the interpreter of the voices of beaſts and birds.

But for Crows and Pies artificially taught to counterfeit mens voyces, it is too ſmall a thing, that for that cauſe they ſhould contend with men. For they have quickly babled all they have learnt with longer coſt and labour, tediouſly ſinging ſtill the ſame ſong, and whatſoever they prate they do it without ſenſe, underſtanding or any reaſon for what they ſay. But man alwayes contemplating ſomewhat more high, ſtill thinks of greater things than theſe preſent, and never reſts. But burning with an infinite and endleſs deſire of knowledg, he doth not only covet to know theſe things which appertain to food and cloathing, but by caſting up his eyes towards heaven, and by the light of his mind, he learns and underſtands things divine. Which is ſo certain an argument of the celeſtiall originall of our ſoul, that he which conſiders thoſe things can no wayes doubt, but that we have our minds ſeaſoned, by the univerſall divine underſtanding. But now it is time for us to ſet thait upon the deſcription of the body, the habitation and fit inſtrument of al the functions of divne mind.

The unquenchable deſire of learning in man.

The End of the ſecond Book.

The third Book,

TREATING

Of the Anatomy of MANS BODY.

I Following the cuſtom and the manner of ſuch as before me have written of Anatomy, will firſt, (that I may make the minds of the Readers more attentive and deſirous of theſe ſtudies) declare how neceſſary it is, and alſo how profitable, and then ſhew the order to be obſerved in it, before I come to the particular deſcription of mans body.

The neceſſity of the knowledg of Anatomy.

Furthermore how Anatomy may be defined, and the manner of the definition of the parts. For the firſt, the knowledg of Anatomy ſeems in my judgment very neceſſary to thoſe that deſire to excell, or attain to perfection of Phyſick; that is, whereby they may be able to preſerve the preſent health of the body, and the parts thereof, and drive away diſeaſes. For how can either Phyſitian or Chirurgeon preſerve health by the uſe of the like things, which conſiſts in the temperament, conformation, and naturall union of the parts; or expell the diſeaſe which hurts thoſe three, by the like uſe of their contraries, unleſs he ſhall know the nature and compoſure of the body, and underſtand as by the rule of this knowledg, how much it ſwerves from the nature thereof? Wherefore it is excellently ſaid of *Hippocrates*; that the Phyſitian called to cure the ſick Patient, ought diligently to conſider, whether thoſe things that are in him, or appear to be in him, be like or unlike, that is, whether the Patient be like himſelf and his own nature in all his parts and functions, temperature, compoſure and union; that he may preſerve thoſe which are yet contained in the bounds of nature, and reſtore thoſe that are gone aſtray. Which thing *Galen* hath alſo confirmed, ſpecially where he ſaith, he muſt wel know the nature and ſtructure or compoſure of the bones, who takes upon him to reſtore them broken or diſlocated to theniſelves and their proper ſeats or places. Moreover ſeeing that healing doth not only conſiſt in the knowledg of the diſeaſe, but as well in preſcribing fit medicines and like application of them to the body and the parts thereof, all which by their naturall diſſimilitude, do require unlike medicines, according to *Galens* opinion: I prethe tell mee, who can perform this, which is ignorant of the deſcription of the whole and the parts thereof, taught by Anatomy? We may ſay the like of the Apothecary, who ignorant of the ſituation of the parts in the body cannot apply Emplaiſters, Ointments, Cataplaſms, Fomentations, Epithemes, bags to the fit places, as to the ſutures of the skull, to the Heart, Liver, Stomach, Spleen, Reins, Wombe or Bladder. For example, let us imagine the Liver to be troubled with a hot diſtemperature, but on the contrary, the ſtomach with a cold (which commonly happens, ſeeing the Liver hotter than it ought to be, ſends up many vapours to the head, from whence cold humors fall into the ſtomach) if hot things to be applied to the ſtomach by the Phyſitians preſcription, be by the Apothecary making no difference, applied both to the ſtomach and neighboring Liver (which may chance if he be ignorant that the ſtomach bends ſomewhat to the left ſide under the breaſt-blade; but the liver ſo takes up the right ſide of the body that with a great part thereof, it covers almoſt all the ſtomach) will not he much offend by increaſing the hot diſtemper of the liver, and not thereby giving eaſe, or help to the diſeaſe? Shall not by this his ignorance, the Patient be fruſtrated of his deſire, the Phyſitian of his intent, and the medicine of its effect? By theſe examples I think it moſt manifeſt, that the Anatomicall knowledg of the parts of the body is exceeding neceſſary to all Phyſitians, Chirurgeons, and Apothecaries, who will practiſe Phyſick with any praiſe to the glory of God, and the benefit and good of man, for whoſe ſake we have writ theſe things, and illuſtrated them by figures, ſubjecting the parts to the eye, and fitly put them in their proper places.

Initio lib. de Offic. medici.

Lib. de oſſibus.

1. de loc. affect. & lib. 3. Meth.

Why when the liver is hot the ſtomach is commonly cold.

The Knowledg of Anatomy, is commodious four manner of wayes.

But Anatomy is commodious four manner of wayes; the firſt is, becauſe thus we are led to the knowledg of God the Creator, as by the effect to the cauſe; for as we read in St. *Paul*, The inviſible things of God are made manifeſt by the viſible. The ſecond is, that by means hereof we know the nature of mans body, and the parts thereof, whereby we may more eaſily and certainly judg and determine of ſickneſs and health. The third is, that by the knowledg of the body and its parts, and together therewith its affections and diſeaſes, we may prognoſticate what is to come, and foretell the events of diſeaſes. Laſtly, the fourth is, that conſidering the nature of the diſeaſed part, we may fitly preſcribe medicines, and apply them in their due places.

There is a threefold method.

Now we muſt declare in what order Anatomy may be fitly delivered; but firſt we muſt obſerve there is a threefold Method; The firſt is called of Compoſition, being very commodious for the teaching of Arts, which *Ariſtotle* hath uſed in his Works of Logick, and naturall Philoſophy, the order and beginning taken from the leaſt and moſt ſimple to the more compound. The ſecond of Diviſion, fit for the inventing or finding out of ſciences. *Galen* hath followed this order in his Books of Anatomicall Adminiſtrations,

and

and of the use of the parts. The third of Definition, which sheweth the nature and essence of things, as appears by *Galen* in his Book *De Arte Parva*. And because this order doth also prosecute the divisions, therefore it is commonly accustomed to be comprehended in the compass of the second. Therefore I will follow this in my Anatomicall Treatise, dividing mans body into its parts, which I will not only subject to the eye in the way of knowing them, but also to the mind in the faithfull understanding them. For I will adjoyn those things that are delivered of them by *Galen* in his Book of Anatom. Administrations, with those which he hath taught in his Books of the use of the parts. For there he fitly laies the parts of mans body before our eyes, to the sense. But here he teaches to know them, not to see them; for he shews why, and for what use they are made. Having briefly handled these things, we must declare what Anatomy is; that as *Cicero* saith out of *Plato's Phædro*, it may be understood of what we dispute. And because we attain that by definition (which is a short and plain speech, consisting of the *Genus* and difference of the things defined, being the essentiall parts, by which the nature and essence of the thing, is briefly and plainly explained) first we define Anatomy, then presently explain the particular parts of the definition.

The Authors intent.

Wherefore Anatomy, (if you have regard to the name) is a perfect and absolute division, or artificiall resolution of mans body into its parts, as well generall as particular, as well compound as simple. Neither may this definition seem illegitimate, specially amongst Physitians and Chirurgeons. For seeing they are Artizans humiliated to the sense, they may use the proper and common qualities of things for their essentiall differences and forms. As on the contrary, Philosophers may refuse all definitions as spurious, which consist not of the next *Genus* and the most proper, and essentiall differences. But seeing that, through the imbecillity of our understanding, such differences are unknown to us, in their places we are compelled in defining things, to draw into one many common and proper accidents, to finish that definition which we intend, which for that cause we may more truly call a description, because for the matter and essentiall form of the thing, it presents us only the matter adorned with certain accidents. This appears by the former definition, in wich *Division* and *Resolution* stand for the *Genus*, because they may be parted into divers others, as it were into *species*. That which is added over and besides, stands in place of the difference, because they separate and make different the thing it self from all other rash and unartificiall dissections. We must know an artificiall division, is no other than a separation of one part from another, without the hurt of the other, observing the proper circumscription of each of them; which if they perish or be defaced by the division, it cannot be said to be artificiall; and thus much may suffice for the parts of the definition in generall.

What Anatomy is.

How a definition differs from a description.

For as much as belongs to the explication of each word; we said *of Mans body*, because as much as lies in us, we take care of, preserve the health, and depell the diseases thereof, by which it may appear that mans body is the subject of Physick, not as it is mans, or consists of matter and form, but as it is partaker of health and sickness.

The subject of Physick.

We understand nothing else by a part, according to *Galen*, than some certain body, which is not wholly disjoined, nor wholly united with other bodies of their kinds; but so that, according to his opinion, the whole being composed therewith, with which in some sort it is united, and in some kind separated from the same, by their proper circumscription. Furthermore by the *parts in generall*, I understand the head, breast, belly, and their adjuncts. By the particular parts of those, I understand, the simple parts, as the similar, which are nine in number, as a gristle, bone, ligament, membrane, tendon, nerve, vein, arterie, musculous flesh; some add fibers, fat, marrow, the nails and hairs; other omit them as excrements; but we must note that such parts are called simple, rather in the judgment of the sense, than of reason. For if any will more diligently consider their nature, they find shall none absolutely simple, because they are nourished, have life and sense, either manifest or obscure, which happens not without a nerve, vein, and artery.

Gal. lib. 1. de usu part. lib. 1. Meth.

The similar parts are nine.

But if any shall object, that no nerve is communicated to any bone, except the teeth; I will answer, that nevertheless the bones have sense by the nervous fibers, which are communicated to them by the *Periosteum*, as by whose mediation the *Periosteum* is connext to the bones, as we see it happens to these membranes, which involve the bowels. And the bones, by this benefit of the animall sense expell the noxious and excrementitious humors from themselves into the spaces between them and the *Periosteum*, which as indued with a more quick sense, admonisheth us, according to its office and duty, of that danger which is ready to seise upon the bones, unless it be prevented. Wherefore we will conclude according to the truth of the thing, that there is no part in our body simple, but only some are so named and thought, according to the sense; although also otherwise some may be truly named simple, as according to the peculiar and proper flesh of each of their kinds. Those parts are called compound which are made or composed by the mediation, or immediately of these simple, which they term otherwise organicall, or instrumentall; as an arm, leg, hand, foot, and others of this kind.

How the bones come to feel.

The compound, or organicall parts.

And here we must observe, that the parts are called simple and similar, because they cannot be divided into any particles but of the same kind; but the compound are called

dissimilar from the quite contrary reason. They are called instrumentall and organicall, because they can perform such actions of themselves, as serve for the preservation of themselves and the whole; as the eye of it self, without the assistance of any other part, seeth, and by this faculty defends the whole body, as also it self. Wherefore it is called an instrument or organe, but not any part of it, as the coats, which cannot of it self perform that act.

Four particles to be observed in each organicall part.

Whereby we must understand, that in each instrumentall part we must diligently observe four proper parts. One by which the action is properly performed, as the Crystalline humor in the eye; another without which the action cannot be performed, as the nerve and the other humors of the eye. The third, whereby the action is better and more conveniently done, as the tunicles and muscles. The fourth, by which the action is preserved, as the eye-lids and circle of the eye. The same may be said of the hand, which is the proper instrument of holding; for it performs this action, first, by the muscle, as the principall part; Secondly, by the ligament, as a part without which such action cannot be performed; Thirdly, by the bones and nails, because by the benefit of these parts, the action is more happily performed; Fourthly, by the veins, arteries and skin, for that by their benefit and use, the rest, and so consequently the action it self is preserved.

Four sorts of instrumentall parts.

But we must consider, that the instrumentall parts have a fourfold order. They are said to be of the first order, which are first and immediately composed of the simple, as only the authors of some one action, of which kinds are the muscles and vessels. They are of a second which consist of these first simple, and others besides, as the fingers. They are counted of the third rank, which are composed of parts of the second order and some besides, as the hand taken in generall. The fourth order is the most composed, as the whole body, the organ and instrument of the soul. But you must observe, that when we say the muscles and vessels are simple parts, we refer you to the sense and sight, and to the understanding, comparatively to the parts which are more compound; but if any consider their essence and constitution, he shal understand they are truly compound, as we said before. Now it remains, that we understand,

Nine things to be considered in each part.

that in each part, whether simple or compound, nine things are to be considered, as substance, quantity or magnitude, figure, composition, number, connexion, (by which name, we also understand the originall and insertion) temperature, action, and use; that by the consideration of these things, every one may exercise the art of Physick, in preserving health, curing diseases, or foreseeing their events and ends.

Why the three principall parts are so called.

But also we must note, that of the organicall parts, there be three, by whose power the body is governed; which for that cause they call regent and principall, because they govern all the rest; they are the liver, heart, and brain. But they are called principall, not only, because they are necessary for life, (for the stomach, wind-pipe, lungs, reins, bladder, and such like parts perhaps are equally as necessary for life) but because from each of these three, some force, power, and faculty, or also matter necessary for the whole body, flow over all the body, when no such thing proceeds from the rest of the parts. For from the liver a matter fit for nourishment, is distributed by the veins through all the body; from the heart the vitall force diffused by the arteries, imparts life to the whole body; from the brain by the nerves a power or faculty is carried through all the parts of the body, which gives them sense and motion.

Lib. de Arte medica.

Galen would have the Testicles to be of this kind, not for the necessity of the individuall, or peculiar body, but for the preservation of the *Species* or kind. And moreover in his book *de Semine* comparing the Testicles with the Heart, hee makes them the more noble by this reason, that by how much it is better to live wel and happily, than simply and absolutely to live, by so much the testicles are more excellent than the heart, because with them we may live well & pleasantly, but with this simply live, as we see by the example of Eunuches, and such as are gelt, by which the Testicles seem rightly to be accounted amongst the principal parts; for nature seeing it desired, that this its work should be immortal, for the attaining of that immortality which it intends, frames those parts, like as prudent founders of a City, who do not only procure to furnish their City with many Inhabitants, so long as they are in building it, but also that it may remain in the same state and condition for ever, or at

The use and function of the parts serving for generation.

least for many ages. And yet notwithstanding of so many cities built in the first memory of man, there remains none, whose fame and state, together with the builders name, is not decayed and perished. But this humane work of nature, stands yet secure for this many thousand of years, and shal endure hereafter, because it hath found a way, by which every one may substitute another in his place before he depart. Hence it is that all creatures have members fit for generation, and pleasures inserted in those members, by which they might be inticed to mutuall embraces and copulations. But the mind, which hath dominion over those members hath an incredible desire of propagating the issue, by which also brute beasts incited, desire to propagate their kinds for ever. For seeing that nature understands all these her works considered particularly by themselves, are frail and mortall, it hath done what it could to recompence that fatall necessity of dying, by a perpetuall succession of individualls.

Hitherto we may seem to have aboundantly shewed what necessity of knowledg in Anatomy belongs to all Artizans in Physick, and also what order is to be observed in the same.

same. And lastly, how it is defined, and the reason of the parts of the definition. Wherefore it remains that we prosecute what we have taken in hand: which is, that we shew and declare how to know all and every the parts of mans body, how many, and what they be, and to understand wherefore they be. For although the true knowledg of Anatomy may be perfected by the sight of the ey, and touching and handling each part with the hand, yet nevertheless the labor of describing Anatomy is not unprofitable. For by reading, such as have often exercised themselves in the dissecting of mens bodies, may refresh and help their memories, and such as have not, may make plain and easie the way to the understanding of dissections.

CHAP. I.

The division or partition of mans Body.

BY reason the partition of Mans body can hardly be understood, if the distinction of the proper faculties of the soul be not understood, for whose cause the body enjoys that form (which we see) and division into divers instruments; Therefore I thought good in few words to touch that distinction of the faculties of the soul, for the better understanding of the partition of the body which we intend. Wherefore the soul, the perfection of the body, and beginning of all its functions, is commonly distinguished, and that in the first and generall division, into three faculties, which are the Animall, Vitall, and Naturall. But the Animall is divided into the principall, sensitive, and motive; Again the Principall is distinguished into the imaginative, reasonable, and memorative: And the Sensitive into seeing, hearing, smelling, tasting, and touching: But the Motive into progressive and apprehensive. And the Vital is divided into the dilative and contractive faculty of the heart and arteries, which we know or understand by the pulsifick faculty. But the Naturall is parted into the nutritive, auctive, and generative faculties; which three perform their parts by the help and ministery of five other faculties, which are, the attractive, retentive, concoctive, assimilative, and expulsive.

What the soul is, and with how many faculties it is endued.

After the self-same manner, the organ or instrument of the soul, to wit, Mans body, at the first division is distinguished into three parts, which from their office they call Animall, Vitall, and Naturall. These again, according to the subdivision of the subalternall faculties, are divided particularly into other parts; so that any one may know the organ of each faculty, by the property of the function. For while other Anatomists divide mans body into four universall and chief parts, they distinguish from the three first, those which they call the Extremities; neither do they teach to what rank of the three prime parts each extremity should be reduced. From whence many difficulties happen in reading the writings of Anatomists; for shunning whereof, we will prosecute, as we have said, that distinction of mans body, which we have touched before.

All the parts of mans body are distinguished into three.

Wherefore, as we said before, mans body is divided into three principall and generall parts, Animall, Vitall, and Naturall. By the Animall parts, we understand not only the parts pertaining to the head, which are bounded with the crown of the head, the collar-bones, and the first *Vertebra* of the breast, but also the extremities, because they are organs and instruments of the motive faculty; *Hippocrates* seems to have confirmed the same, where he writes; Those who have a thick and great head, have also great bones, nerves, and limbs. And in another place he saith, those who have great heads, and when they stoop shew a long neck, such have all their parts large, but chiefly the Animall. Not for that *Hippocrates* would therefore have the head the beginning and cause of the magnitude and greatness of the bones and the rest of the members; but that he might shew the equality and private care or government of nature, being most just and exact in the fabrick of mans body, as if she hath well framed the head, it should not be unlike that she idly or carelessly neglected the other parts which are less seen. I thought good to dilate this passage, lest any might abuse that authority of *Hippocrates*, and gather from thence, that not only the bones, membranes, ligaments, grisles, and all the other animall parts, but also the veins and arteries depend on the head as the originall. But if any observe this our distinction of the parts of the body, he will understand we have a far other meaning.

What parts are here called Animall.

Lib. 6. Epidem.

By the Vitall parts, we understand only the heart, arteries, lungs, winde-pipe, and other particles annexed to these. But by the Naturall, we would have all those parts understood which are contained in the whole compass of the *Peritoneum* or Rim of the body, and the processes of the *Erythroides*, the second coat of the Testicles. For as much as belongs to all the other parts, which we call containing; they must be reckoned in the number of the Animall, which notwithstanding, we must thus divide into principall, sensitive, and motive; and again, each of these in the manner following. For first, the principall is divided into the imaginative, which is the first and upper part of the brain, with its two ventricles and other annexed particles; into the reasoning, which is a part of the brain, lying under the former, and (as it were) the top thereof with its third ventricle; into the memorative, which is the *cerebellum* or afterbrain, with a ventricle hollowed in its substance. Secondly, the Sensitive is parted into the visive, which is in the eys; the auditive, in the

What parts are called Vitall.

The division of the animall parts.

the eares; the ſmelling,in the noſe;the taſting,in the tongue and palate;the tactive,or touching which is in the body, but moſt exquiſite in the skin which inveſts the palms of the hands.Thirdly,the motive is divided into the progreſſive,which intimates the legs, and the comprehenſive,which intimates the hands.Laſtly,into ſimply motive,which are three parts, called bellies,for the greateſt part terminating and containing; for the vitall, the inſtrument of the faculty of the heart, and dilatation of the arteries, are the direct or ſtreight fibers,but of the conſtrictive the tranſverſe; but the three kinds of fibers together,of the pulſifick; or if you pleaſe you may divide them into parts ſerving for reſpiration, as are the lungs,and weazon,and parts ſerving for vitall motion,as are the heart and arteries,furniſhed with theſe fibers,which we formerly mentioned. The diviſion of the naturall parts remains,which is into the nouriſhing,auctive and generative,which again are diſtributed into attractive,univerſall,and particular;retentive, concoctive, diſtributive, aſſimilative, and expulſive.The attractive,as the gullet and upper orifice of the ventricle; the retentive, as the *Pylorus* or lower paſſage of the ſtomach; the concoctive,as the body of the ventricle, or its inner coat;the diſtributive,as the three ſmall guts;the expulſive, as the three great guts; we may ſay the ſame of the liver,for that draws by the meſaraick and gate veins, retains by the narrow orifices of the veins diſperſed through the ſubſtance thereof,it concocts by its proper fleſh;diſtributes by the hollow vein,expels by the ſpleen, bladder of the gall and kidnies. We alſo ſee the parts in the teſticles divided into as many functions; for they draw by the preparing veſſels; retain by the various crooked paſſages; in the ſame veſſels they concoct the ſeed by the power of their proper ſubſtance and faculty; they diſtribute by the ejaculatory,at the glandules called *Proſtatæ*, and the horns of the wombe, ſupplying the place of proſtates; Laſtly,they expell or caſt forth by the proſtates, horns, and adjoining parts. For as much as belongs to the particular attraction,retention,concoction,diſtribution,aſſimilation of each part,that depends of the particular temper,and as they term it,occult property of each ſimilar and ſimple part. Neither do theſe particular actions differ from the univerſall, but that the generall are performed by the aſſiſtance of the three ſorts of fibers, but the ſpecial by the ſeverall occult property of their fleſh, ariſing from their temperature, which we may cal a ſpecifick property.Now in the compoſition of mans body,nature principally aims at three things.The firſt is,to create parts neceſſary for life,as are the heart,brain, and liver. The ſecond,to bring forth other for the better & more commodious living,as the eyes, noſe, ears,arms and hands. The third is,for the propagation and renewing the *ſpecies* or kind, as the privie parts,teſticles, and wombe. And this is my opinion, of the true diſtinction of mans body,furniſhed with ſo many parts, for the performance of ſo many faculties; which you, if you pleaſe, may approve of and follow. If not, you may follow the common and vulgar, which is, into three bellies,or capacities,the upper,middle, lower, (that is, the head, breſt and lower belly) and the limbs or joints. In which by the head we do not underſtand all the Animall parts,but only thoſe which are from the crown of the head to the firſt *vertebra* of the neck, or to the firſt of the back, if according to the opinion of *Galen*, *Lib. de oſſibus*, where he makes mention of *Enarthroſis* and *Arthrodia*, we reckon the neck amongſt the parts of the head. By the breſt, whatſoever is contained from the coller bones to the ends of the true and baſtard,or ſhort ribs,and the midriffe. By the lower belly,the reſt of the trunck of the body,from the ends of the ribs to the ſhare-bones; by the limbs,we underſtand the arms and legs. We will follow this diviſion in this our Anatomicall diſcourſe, becauſe we cannot follow the former in diſſecting the parts of mans body,by reaſon the Animall parts are mutually mixed with the vitall and naturall, and firſt of the lower belly.

The diviſion of the vitall parts.

The diviſion of the naturall parts.

The vulgar diviſion of mans body.

Why the belly is not bony.

Nature would not have this lower belly bony,becauſe the ventricle might be more eaſily dilated by meat and drink,children might grow the better, and the body be more flexible. It is convenient we begin our Anatomical adminiſtration from this,becauſe it is more ſubject to putrefaction than the reſt,both by reaſon of its cold and moiſt temperature, as alſo by reaſon of the feculent excrements therein contained. Yet before we go any further,if the Anatomicall adminiſtration muſt be performed in publick, the body being firſt handſomely placed,and all the inſtruments neceſſary for diſſection made ready,the belly muſt be divided into its parts,of which ſome contain, and other ſome are contained.

The diviſion of the lower belly.

They are called containing,which make all that capacity which is terminated by the *Peritonæum* or Rim of the belly. The upper part whereof is bounded by *Galen* within the compaſs of the direct muſcles,and by a generall name is called *Epigaſtrium*, or the upper part of the lower belly. That again is divided into three parts, that is, into that which is above the navil,and which carries the name of the whole,into that which is about the navil,and is called the umbilicall or middle part; and laſtly, into that which is below the navill,called the *Hypogaſtrium*,or the lower part of the lower belly.

The *Hypochondria*.

In every of which three parts there be two laterall, or ſide parts to be conſidered, as in the *Epigaſtrium*, the right and left *Hypochondria*, which are bounded above and below, in the compaſs of the midriffe,and the ſhort ribs.In the umbilicall the two *Lumbares* (ſome call them *Latera* ſides) which on both ſides from the loweſt parts of the breſt, are drawn to the flanks or hanch-bones; in the *Hypogaſtrium*, the two *Ilia*, or flanks, bounded with

with the hanch and ſhare-bones. Neither am I ignorant, the *Ilia*, or flanks, which the Greeks call Λαγόνες ſignifie all the empty parts, from the ends of the ribs, even to the hanch-bones, whereupon they alſo call them Κενεῶνες, as if you ſhould ſay empty ſpaces, becauſe they are not encompaſſed with any bone. Yet I thought good that this doctrine of dividing the belly ſhould be more diſtinct, to call the parts which are on each ſide the navell *Lumbares*, and thoſe on the lower part of the lower belly *Ilia*, flanks. But we muſt obſerve that the Ancients have been ſo diligent in deciphering the containing parts, that as exactly as might be, they deſigned the bowells contained in the belly, which being divers lie in ſundry places; for the greater portion of the liver lies under the right *Hypochondrium*; under the left almoſt all the ventricle and ſpleen. Under the *Epigaſtrium* the lower orifice of the ventricle, and the ſmaller portion of the liver; In the *Lumbares*, or ſides, in the right and upper part the right kidney, in the lower part towards the flanck, the blind gut; in the middle part thereof the colick and empty guts. In the upper part of the left ſide lies the left Kidney, in the middle part, the reſt of the empty and colick guts. Under the region of the navell, lies the girdle or upper part of the kall, the colick gut thruſting it ſelf alſo through that way. Under the *Ilia*, or flanks, the right and left, lie the greater part of the gut Ileon, the horns of the women big with child, and the ſpermatick veſſels in men and women. Under the *Hypogaſtrium* in the lower part lies the right, or ſtrait gut, the bladder, womb, and the reſt of the kal.

If we know, and well underſtand theſe things, we ſhall more eaſily diſcern the parts affect by the place of the pain, and cure it by fit application of remedies, without the hurting of any part. The diſtinction of ſuch places, and the parts in thoſe places, as ſeeming moſt profitable, I have thought good to illuſtrate by the placing theſe two following figures, in which thou haſt deciphered, not only the foreſaid parts, containing, and contained, but alſo of the whole body, and many other things which may ſeem to conduce to the knowldge of the mentioned parts. The Figures are theſe.

A moſt certain note of the part affected by the place where the pain is.

The Figure ſhewing the foreparts of the body.

A The hairy Scalp, cald τὸ χωτὸς.
b the forehead cald *Frons* μέτωπον.
c the temples cald *tempora*, κρόταφοι
From *b* to *d* The compaſs of the face.
e The greater or inward corner of the eyes, cald *Canthus internus*.
f The leſſer or externall angle of the eye, cald *Canthus externus*.
* The lower eybrow which is immovable, *Palpebra*.
g The cheek-bal cald *mala*, μῆλα.
h The cheek-puf cald *bacca*, γνάθος.
i The ridg of the noſe cald *Naſus externus*, ῥὶν.
k The noſthrils cald *nares*, μυκτῆρες.
l The outward ear, *auris externa*.
m The mouth made of the two lips, ὄς.
n The chin called *mentum*, γένειον.
o The neck, *ceſſum*, αὐχὴν and τράχηλος.
From *o* to *e* the pillar of the neck, *truncus* and δέμας.
pp The hollow of the neck, called *jugali*, σφαγαὶ.
qq The patel bones, *clavi*, κλεῖδες.
r The cheſt, *pectus*, στῆθος.
ſ The right breſt.
ſſ The left breſt: to this Region we apply cordiall *Epithemations* moiſt and dry.
tt The nipples of the breſts, *papillæ*, θηλαὶ.
u The trench of the heart which the Ancient called καρδία. The Latines *ſcrobiculus Cordis*. This part is anointed for the mouth of the ſtomach.
From *u* to *E*, the lower belly, γαστὴρ.
X The *Epigaſtrium* or upper part of the lower belly.
yy The *Hypochondria* or *Præcordia*.
* The outward Liver-remedies are applied to this place.
z The region of the navill, called *umbilicalis*, or the middle part of the lower belly.
A. The navill *umbilicus*. The root of the belly ὀμφαλὸς.
BB. The ſide *Latera*, πλευραὶ. and in our Author *Lumbi ſeu Lumbaris regio*.
C. *Hypogaſtrium*, the water-courſe, *Aqualiculus*, the lower part of the lower belly, ἧλεον.
DD. The flanks called *Ilia*, and λαγόνες.
E. The Groin called *pubes* or *pectenalis regio* κρύφιον.
FF. The Leske cald *inguen* where thoſe tumors are cald *bubones*.
G. The yard with the fore-skin, *penis cum præputio*.
H. The ſtones or teſticles, with the cod or *ſcrotum*.
II. The ſhoulders, *humeri*, ὦμοι.
KK. The arms *Brachia*, βραχίονες.
L. The bowt of the arm, called *Gibber*, ἀγκὼν.
M. The outſide of the lower part of the arm called *cubitus*, πῆχυς.
N. The wriſt called *Brachiale*, καρπὸς.
O. The after wriſt *poſtbrachiale*, μετακάρπιον.
P. The Palm called *Palma* or *vola manus*, θέναρ.
φ The back of the hand, *Dorſum manus*, ὀπίσθιον θέναρ.
QQ. The fore and middle part of the thigh, where we apply cupping-glaſſes to bring down womens courſes. μηροὶ.
RR. The knee, *genu*. γόνυ.
SS. The leg, *tibia*, κνήμη.
TT. The calf of the leg, *ſura*, γαστροκνήμιον.
VV. The inſtep, *tarſus*.
XX. The top of the foot, *Dorſum pedis*, ὀπίσθιον πόδος.
YY. The inner Anckles, σφυρὰ.
ZZ. The outward anckles, *αα* the toes of the feet, *ββ* the place under the inward anckle, where the vein called *Saphena* is opened.

The figure of the back-parts of a Man.

A. The forepart of the head, *ſynciput*, βρεγμά.
B the top or crown of the head, *vertex*, κορυφή
C. the hinder-part of the head, *occiput*, κοτὶς καὶ ἰνιὸν.
From D. to D. the face, *facies*, πρόσωπον.
*E. the eybrows, *ſupercilia*, ὀφρύς.
F. the upper eylid, βλέφαρον.
G. the rip of the noſe, called *globulus noſi*.
H. the back-part of the neck, called *cervix*, αὐχήν, and the nuke or nape of the neck. There is a hollowneſs at the top of this *cervix*, where we apply Seatons.
I. the back-part of the ſhoulder top, called *axilla*, ὦμος.
KK. the ſhoulder blades, *ſcapulæ*, ὠμοπλάται.
1,2,3. On this place we ſet Cupping-glaſſes.
4,5,6,7. the back, *dorſum*, νῶτον.
8, 9. the ridg, *ſpina dorſi*. ῥάχις.
L. the armhole, *ala*, μαχάλη.
* The elbow, *gibber brachii*.
M M M M. the ſides, *latera*.
N N. the loins, *lumbi*, or the region of the kidneys, ὀσφύες.
O O. the place of the hips, *coxendices*, where we apply remedies for the Sciatica.
P. the place of the Holy bone, or *Os ſacrum*, where we apply remedies in the diſeaſes of the right gut.
Q. the place of the rump or *Coccyx*.
R R. the buttocks, *nates*, κλῶνες.
S S. the back parts of the thigh, *femen*.
T T. the ham, *poples*, ἰχνὺς.
VV. the calf of the leg, *ſura*.
X X. the foot, or *parvus pes*, πούς.
Y Y. the utter ankle, *malleolus externus*.
Z Z. the heel, *calx*, or *calcaneus*, πτέρνα.
a a. the ſole of the foot, *planta pedis*, κοῖλον τοῦ ποδός.
b. the inſide of the lower part of the arm, called *ulna*, ὠλένη.
c. the outſide of the ſame, *cubitus*, πυγὼν.
d d. the wriſt, *carpus*.
e e. the back-part of the hand, *dorſum manus*, g. the foreſinger, *index*, λείχανος. h. the thumb, *pollex*, ἀντίχειρ.
i. the middle finger, *medius*, μέσος.
k. the ring finger, *annularis*, *medicus*, ἰατρικὸς.
l. the little finger, *auricularis*, *minimus*, ὠτίτης.

CHAP. II.

Of the containing parts of the Epigaſtrium, and the preparation to Anatomicall adminiſtration.

The containing parts of the lower belly.

THe containing parts of the *Epigaſtrium*, are the *Epidermis*, or thin outward skin; the true skin; the fleſhy or fatty Pannicle; the eight muſcles of the *Epigaſtrium*, with their common coat; the Rim of the belly; the five vertebra's of the loins; all the holy-bone; the hanch-bone; ſhare-bone; the white line and midriff. Of theſe parts, ſome are common to the whole body, as the three firſt; the other proper to the parts contained in the *Epigaſtrium* taken in generall. Which that you may ſee in their order, firſt you muſt cut round about the navell, to the upper ſuperficies of the muſcles, that ſo we may keep it, till ſuch time, as occaſion ſhall offer it ſelf, to ſhew the umbilicall veſſels lying in that place, which are one vein, two arteries, and the *Urachus* (if it be there.) Which being done, you muſt draw a ſtreight line from the cheſt, over the breſt-blade, even to the ſhare-bone, which may divide the common-containing parts, even to the white line.

Then preſently it will be convenient to draw two other lines acroſs or overthwart, of the like depth on each hand, from the circumference of the navell, even to the ſides, that ſo on each part we may draw the skin more commodiouſly from the parts lying under it; the ſight of which otherwiſe it would hinder. Theſe things being done, the skin muſt be

be divided from the parts lying under it from the designed circumference left about the navell. We must teach how the skin is twofold, the true and false, and render a reason of the name, which we will every where do, as far as the thing will suffer, and it shall lye in our power. And in doing or examining these things, it will be convenient diligently to enquire into the nine things mentioned in the Preface. We will begin with the Skin, because that part is first obvious to our senses.

CHAP. III.

Of the utmost Skin or Cuticle.

The skin twofold

THe skin being the first part, and spred over all the body, is twofold, that is, the true and bastard skin: The true is called by the Greeks, *Derma*, which may almost every where be pulled from the parts lying under it, which it invests; except in the face, ears, the palms of the hands, soles of the feet, fingers, and privities, where it sticks so close that it cannot be separated.

From what parts the skin cannot be separated.

The bastard (which first of all we will declare, because it first presents it self to our sight) is by the Greeks called *Epidermis*, because it covers the true skin, they term it commonly the Cuticle. The substance of it is excrementitious, and (as it were) a certain dry flouring, or production of the true skin. That it draws not its substance from the seed is apparent by this, that as it is easily lost, so it is easily repaired, which happens not in parts truly spermaticall. This utmost thin skin, or Cuticle, may two manner of ways be made apparent by it self, and separated from the other, as by burning with fire, or ardent heat of the Sun, (in some delicate bodies, and such as are not accustomed to be conversant in Sunshine.) The quantity in thickness is very small, but the extent is most large, because it covers all the skin; the figure of it is round, and long, like those parts which it invests. The composure of it is obscure; yet because this Cuticle is the excrement of the true skin; we say it hath its matter from the excrementitious superfluity of the nerves, veins, arteries, and substance of the true skin.

The matter of the Cuticle.

The quantity.

The figure.

The composure.

It is in number one, like as the true skin which it outwardly covers, that it might be a *medium* between the object and fixed faculty of touching, diffused over all the true skin, which every where lies under it. For the temperature, by the common consent of Physitians, it is in the midst of all excess; for that seeing it is the *medium* between the object and faculty, if it should be hotter, colder, moister, or drier, it would deceive the faculty by exhibiting all objects, not as they are of themselves, but as it should be; no otherwise than as to such as look through red or green spectacles, all things appear red or green. Wherefore for this reason it was convenient the Cuticle should be void of all sense. It hath no action in the body; but it hath use, for it preserves and beautifies the true skin; for it seems to be given by the singular indulgence of nature, to be a muniment and ornament to the true skin. This providence of Nature, the industry of some Artizans (or rather Curtizans) doth imitate; who for to seem more beautifull, do smooth and polish it. By this you may understand, that not all the parts of the body have action, yet have they their use, because, according to *Aristotles* opinion, Nature hath made nothing in vain. Also you must note that this thin skin or Cuticle being lost, may every where be regenerated, unless in the place which is covered with a scar. For here the true skin being deficient, both the matter and former faculty of the Cuticle is wanting.

The number.

The temperature.

The use.

Why the Cuticle cannot be restored in scars.

CHAP. IIII.

Of the true Skin.

The substance. Magnitude.

THe true skin called by the Greeks *Derma*, is of a spermatick substance, wherefore being once lost, it cannot be restored as formerly it was. For in place thereof comes a scar, which is nothing else but flesh dried beyond measure. It is of sufficient thickness, as appears by the separating from the flesh.

But for the extent thereof, it encompasses the whole body, if you except the eys, ears, nose, privities, fundament, mouth, the ends of the fingers where the nails grow, that is, all the parts by which any excrements are evacuated. The figure of it is like the Cuticle, round and long, with its productions, with which it covers the extremities of the parts.

Figure.

It is composed of nerves, veins, arteries, and of a proper flesh and substance of its kind, which we have said to be spermaticall, which ariseth from the process of the secundine, which lead the spermatick vessels even to the navell; in which place each of them into the parts appointed by nature, send forth such vessels as are spred abroad and diffused from the generation of the skin. Which also the similitude of them both, that is, the skin

Composure.

and

and membrane *Chorion* do argue. For as the *Chorion* is double, without ſenſe, encompaſſing the whole infant, lightly faſtened to the firſt coat, which is called *Amnios*; ſo the skin is double, and of it ſelf inſenſible, (for otherwiſe the nerves were added in vain from the parts lying under it) ingirting the whole body, lightly cleaving to the fleſhy Pannicle. But if any object, That the Cuticle is no part of the true skin, ſeeing it is wholly different from it, and eaſily to be ſeparated from it, and wholly void of ſenſe: I will anſwer, theſe arguments do not prevail. For that the true skin is more craſs, thick, ſenſible, vivid, and fleſhy, is not of it ſelf, being rather by the aſſiſtance and admixture of the parts, which derived from the three principall it receives into its proper ſubſtance; which happens not in the Cuticle. Neither if it ſhould happen, would it be better for it, but verily exceeding ill for us, becauſe ſo our life ſhould lye fit and open to receive a thouſand externall injuries, which encompaſs us on every ſide, as the violent and contrary acceſs of the four firſt qualities.

The skin of it ſelf is void of ſenſe.

The number.

There is only one skin, as that which ſhould cover but one body, the which it every where doth, except in thoſe places I formerly mentioned. It hath connexion with the parts lying under it by the nerves, veins, and arteries, with thoſe ſubjacent parts put forth into the skin inveſting them, that there may be a certain communion of all the parts of the body amongſt themſelves.

Connexion.

Temperature.

It is cold and dry in its proper temper, in reſpect of its proper fleſh and ſubſtance, for it is a ſpermaticall part. Yet if any conſider the ſinews, veins, arteries, and fleſhy threds which are mixed in its body, it will ſeem temperate, and placed (as it were) in the midſt of contrary qualities, as which hath grown up from the like portion of hot, cold, moiſt, and dry bodies. The uſe of the skin is to keep ſafe and ſound the continuity of the whole body, and all the parts thereof, from the violent aſſault of all externall dangers; for which cauſe it is every where indued with ſenſe, in ſome parts more exact, in others more dull, according to the dignity and neceſſity of the parts which it ingirts, that they might all be admoniſhed of their ſafety and preſervation. Laſtly, it is penetrated with many pores, as breathing-places, as we may ſee by the flowing out of ſweat, that ſo the arteries in their *diaſtole* might draw the encompaſſing air into the body, for the tempering and nouriſhing of the fixed inbred heat, and in the *ſyſtole* expell the fuliginous excrement, which in Winter ſuppreſt by the cold air encompaſſing us, makes the skin black and rough. We have an argument and example of breathing through theſe, by drawing the air in by tranſpiration, in women troubled with the mother, who without reſpiration live only for ſome pretty ſpace by tranſpiration.

Uſe.

The reaſon why the skin is blacker and rougher in Winter.

CHAP. V.

Of the fleſhy Pannicle.

After the true skin, follows the membrane, which Anatomiſts call the fleſhy Pannicle, whoſe nature that we may more eaſily proſecute and declare, we muſt firſt ſhew what a Membrane is, and how many ways the word is taken. Then wherefore it hath the name of the fleſhy Pannicle. A membrane therefore is a ſimple part, broad and thin, yet ſtrong and denſe, white and nervous, and the which may eaſily without any great danger be extended and contracted. Sometimes it is called a coat, which is, when it covers and defends ſome part. This is called the fleſhy Pannicle; becauſe in ſome parts it degenerates into fleſh, and becomes muſculous, as in a man from the coller-bones, to the hair of the head, in which part it is therefore called the broad muſcle, whereas in other places it is a ſimple membrane, here and there intangled with the fat lying under it, from whence it may ſeem to take or borrow the name of the fatty Pannicle. But in beaſts (whence it took that name, becauſe in thoſe a fleſhy ſubſtance maketh a great part of this Pannicle) it appears manifeſtly fleſhy and muſculous over all the body, as you may ſee in Horſes and Oxen; that by that means being moveable, they may drive and ſhake off their flies, and other troubleſome things, by their ſhaking and contracting their backs. Theſe things conſidered, we ſay the fleſhy Pannicle in its proper body, is of a nervous or membranous ſubſtance, as that which hath its originall from the coat *Amnios*, (which is next to the infant) dilated near to the navell, and ſtretched forth for the generation of this Pannicle; in which thing I think good to note, that as the membranes *Chorion* and *Amnios* mutually interwoven with ſmall nervous fibers, encompaſs and inveſt the child as long as it is contained in the womb; ſo the skin and fleſhy Pannicle, knit together by ſuch like bands, engirt the whole body.

What a membrane is.

Why it is ſometimes called a coat, ſometimes the fleſhy and fatty Pannicle.

Why beaſts have this Pannicle wholly fleſhy or muſculous.

The ſubſtance.

The magnitude and figure.

Therefore the fleſhy Pannicle is equal in magnitude and like in figure to the true skin, but that it lyes under it, and is contained in it, in ſome places mixt with the fat, in others increaſed by the fleſh interwoven with it, and in other ſome is only a ſimple membrane.

Number.

Compoſure.

The compoſition of it is ſuch, as the ſight of it preſents to our ey, that is, of veins, arte-

arteries, nerves, and the proper flesh, some whites mixed and interlaced with fat, and sometimes with musculous flesh. It is but one, by reason of the use we shall presently shew; it is situated between the skin and fat, or common coat of the muscles, annexed to these and the other parts lying under it, by the veins, nerves and arteries ascending from these inward parts, and implanting themselves into the substance thereof, and then into the true skin.

The temperature thereof is diverse, according to the variety of the parts interwoven with it. The use of it is, to lead, direct, and strengthen in their passage, the vessels which are disseminated into the true skin, and the whole superficies of the body. But in beasts it hath another commodity, that is, it gives a shaking or trembling motion to their skin and back, for that cause we formerly touched.

The temperature.
The use.

CHAP. VI.

of the Fat.

THe Fat coming near the condition of an excrement, rather than of a part (as we said, when we treated of the similar parts) is of an oily substance, bred of the aery and vaporous portion of the blood, which sweating through the pores of the coats, or mouths of the vessels, becomes concrete about the membranes, and nerves, and cold bodies, and turns into fat by the coldness of the place. Whereby we may know, that cold, or a more remiss heat, is the efficient cause of fat, which is manifest by contemplation not only of creatures of divers kinds, but also by those of the same species and sex, if so be that the one be colder than the other.

The Fat is rather an excrement than a part.
The substance.

The efficient cause of Fat.

By which we may understand that the fat is the more or less in quantity, according to the different temper of the whole body, and of its particular parts; for its composition, it consists of that portion of the blood which we formerly mentioned, intermixt with certain membranes, nervous fibers, veins and arteries. The greatest part of it lyes between the fleshy Pannicle, and the common coat of the Muscles. * Otherwise it is diffused over all the body, in some places more, in some less, yet it is always about the nervous bodies, to which it delights to cleave. Most Anatomists enquire whether the fat lye above or beneath the fleshy Pannicle. But me thinks this question is both impertinent and idle; being we often see the fat to be on both sides. *a* It is of a middle temper, between heat and cold, being it ariseth of the more aery portion of the blood; although it may seem cold in respect of the efficient cause, that is, of cold by which it concretes. For the rest, moisture is predominant in the fat. *b* The use thereof is, to moisten the parts which may become dry by long fasting, vehement exercise, or immoderate heat; and besides to give heat, or keep the parts warm. Although it do this last rather by accident, than of its own nature, as heated by exercise, or by some such other chance; it heats the adjacent parts, or may therefore be thought to heat them, because it hinders the dissipation of the native and internall heat; like as cold heats in winter, whereby the bellies are at that time the hotter. I know some learned Physitians of our time stiffly maintained, that the fat was hot, neither did they acknowledg any other efficient cause thereof, than temperate heat and not cold. But I think it best to leave the more subtil agitation of these questions to naturall Philosophers. But we must note, *c* that at the joints which are more usually moved, there is another sort of Fat, far more solid and hard, than that which we formerly mentioned, often found mixed with a viscid and tough humor like the whites of Eggs, that so it might be sufficient for a longer time to moisten these parts, subject to be hurt by dryness, and make them slippery, and so fitter for motion, in imitation whereof they usually grease hard bodies, which must be in frequent motion, as Coach-wheels and axletrees. And there is another kind of fat, which is called *Sevum*, seam, in one thing differing from the ordinary fat, that is much dryer; the moister and softer portion of the fat being dissipated by the raging heat of the place. For it is found principally about the midriff, where there are many windings of arteries and veins; and it is also about the reins, loins, and basis of the heart. The Fat is wasted by long fasting; is dryed and hardened by vehement exercise and immoderate heat. Hence it is that it is much more compact in the palms of the hands, and soles of the feet, about the eys and heart, so that it resembles the flesh in density and hardness; because by the continuall motion and strong heat of these parts, the thinner portion being dissipated and diffused, the more gross and terrestriall remain.

The quantity.
The composure.
The fire.

I was present at the opening of a body, Feb. 1630. in which the fat in the lower part of the lower belly was in thickness above 8 inches, upon the breast between 4 and 5 inches: which I thought good to remember in this place both for the rarity of the thing, as also because it was encreased by repute, and the place mistaken, some saying the *Omentum* or Call was so thick, which was false, for it did not much exceed the quantity of that part, in other fat men.

a The temper.
b The use.
c The solider fat, or seame.

In what parts and for what cause the fat is more dense.

CHAP.

CHAP. VII.

Of the common coat of the Muſcles.

The ſubſtance. NExt under the Fat, appears a certain coat, ſpred over all the Muſcles, and called the common coat of the Muſcles, it is of a nervous ſubſtance, as all other membranes are. The quantity and breadth thereof is bounded by the quantity of the Muſcles which it involves, and fits it ſelf to, as that which encompaſſes the Muſcles of the *Epigaſtrium*, is of equal largeneſs with the ſame Muſcles. The figure of it is round: it is compoſed of veins, nerves, arteries, and its peculiar fleſh conſiſting of three ſorts of fibers; the beginning of it is from the *Perioſtium*, in that part where the bones give ligaments to the Muſcles; or according to the opinion of others, of the nervous and ligamentous fibers of the Muſcles, which riſing up and diffuſed over the fleſhy ſuperficies thereof, are united for the generation of this coat. But this membrane ariſing from the *Perioſtium* (as every membrane which is below the head takes it originall from the *Perioſtium* either primarily, by the interpoſition of no Medium, or ſecondarily) is ſtretched over the Muſcles by their tendons. But if any object, That this membrane pluck'd from the belly of the Muſcle, may ſeem to end in a ligament. I will anſwer, that it is the condition of every nervous part, ſo to binde or faſten it ſelf to another part of his own kinde as to a ſtay, ſo that it can ſcarce be pluck'd from thence. We ſee the proof hereof, in the *Peritonæum* or Rim in the *Epigaſtrium* or lower part of the lower belly. That which covers the Muſcles of the *Epigaſtrium* is but one, unleſs you had rather part it in two, the right and the left diſtinguiſhed by the interpoſition of the *Linea Alba*, or white Line. It is ſituate betwixt the Fat and Muſcles; for it is faſtened above and below to theſe parts with fibers, which in ſmalneſs and fitneſs exceed the Spiders web. But by its veſſels, it participates with the three principall parts, and is of a cold and dry temper. The uſe of it is, to contain the Muſcles in their naturall union, and to keep them as much as in it lyes, from putrefaction, which may happen to them from *pus* or matter, which is often caſt forth of the ſimilar parts into the empty ſpaces and diſtances of the Muſcles. Wherfore going about to ſeparate the Fat of the *Epigaſtrium* (where thou muſt begin the diſſection of mans body) you muſt have a care that you hurt it not with your knife, but that, before you touch the Muſcles, ſee you artificially take it away, that you may the more eaſily ſeparate the Muſcles lying under it, diſtinguiſhed by a manifeſt ſpace at the white Line, which is made by the meeting together of the proper coats of all thoſe Muſcles.

The quantity.

The compoſure.

The Originall.

The number.

The ſite.

The uſe.

What the white line is.

CHAP. VIII.

What a Muſcle is, and how many differences there be thereof.

What a Muſcle is. A Muſcle is the inſtrument of voluntary motion; and ſimple voluntary motion is performed ſix manner of ways, upwards, downwards, forwards, backwards, to the right hand and to the left; but the compound one way, which is circularly, the which is performed by the continuall ſucceſſion of the motion of the Muſcles ingirting the part. Such a motion Falconers uſe when they ſtretch forth their hand and lure their Hawk. We have ſome parts, which have motion without a Muſcle, but that motion is not voluntary; ſuch parts be the heart, ſtomach, guts, both the bladders, (that is, that of the gall and that of the urine) and divers other which have the motions of attraction, expulſion and retention, by the means of the three ſorts of fibers; for they draw by the right, expell by the tranſverſe, and retain by the oblique. The differences of Muſcles which are many and diverſe, are taken from their ſubſtance, originall, inſertion into the part which they move, form or figure, holes or openings, magnitude, colour, ſite, kinde of fibers, their conjugation or connexion, heads, bellies, tendons, oppoſition in action and office. Some in ſubſtance are nervous, venous, arterious, becauſe they have manifeſt nerves, veins, and arteries, as the Midriff, the Intercoſtall or Epigaſtrick Muſcles, and many more, and that for their difference from other Muſcles, into which neither nerve, nor vein, or arteries are manifeſtly inſerted, although ſecretly they admit them all for ſenſe and motion, life and nouriſhment; ſuch are the Muſcles of the wriſt, the wormy Muſcles of the hands and feet; for if there be any nerves obſerved in them, they are very ſmall. Some had rather make the difference of Muſcles thus, that ſome of them are fleſhy, ſome nervous, others membranous. From their Originall, ſome ariſe from the bones, as theſe which move the hands, arms, and legs; others from griſles, as the Muſcles of the throat; others from membranes which inveſt the tendons, as the wormy Muſcles of the hands and feet; others from ligaments, as the Extenders of the fingers; others from other Muſcles, as the two lower Muſcles of the yard which proceed from the Sphincter Muſcle of the fundament. Others have no originall, as the membrane which we call the fleſhy Pannicle aſſumes fleſh

How the circular motion is performed.

From whence the differences of Muſcles are drawn.

Differences of Muſcles from their ſubſtance

Differences of Muſcles from their originall.

in

in certain places,and degenerates into a Muſcle; ſuch are the *Cremaſter* or hanging Muſcles of the teſticles, the large Muſcles of the face, and if you pleaſe the Midriff, as that which is compoſed of two coats, the one encompaſſing the ribs and the *Peritonæum*, hath fleſh in the midſt between the two membranes. And moreover ſome Muſcles have their originall from one only bone, as theſe which bend and extend the Cubit; others ariſe of many bones,as the oblique deſcending, the Dorſall and many Muſcles of the neck, which ariſe together from many ſpondyls and ſides of ſpondyls. There be others, according to the opinion of ſome men, both from the bones and griſles of the *Pubis* at the right or direct Muſcles of the *Epigaſtrium*, yet by their favor I think otherwiſe. Becauſe by the Anatomicall and received axiome,A muſcle is there thought to take his beginning, from whence he receives a nerve; but theſe Muſcles take a nerve from the intercoſtall muſcles, wherefore their originall ought to be referred to the ſides of the breſt-blades, as ſhall be ſhewed in due place. From their inſertion ariſe theſe differences, ſome are inſerted into a bone, as thoſe which move the head, arms and legs; others into a griſle, as thoſe of the Throtle, ey-lids, noſe, and the oblique aſcendent muſcles of the *Epigaſtrium*; ſome into a bone and griſle both, as the right muſcles of the *Epigaſtrium* and the Midriff; ſome into the skin, as the muſcles of the lips; others into the Coats,as the muſcles of the eys; others into Ligaments,as the muſcles of the yard. But theſe differences following may be drawn both from their inſertion and originall. For ſome muſcles ariſing from many parts,are inſerted into ſome one part, as divers of theſe which move the arm and the ſhoulder,which ariſing from many ſpondyls, are inſerted into the bone of the ſhoulder, and the ſhoulder-blade. Others ariſe from one part, and inſert themſelves into more, as thoſe which ariſe from the bottom of the ſhoulder-blades,are extended and inſerted into ſome eight or nine of the upper ribs,to help reſpiration; and the benders and extenders of the fingers and toes: Others ariſing from many bones, are inſerted into as many, as ſome of thoſe which ſerve for reſpiration,to wit thoſe which we call the hinder Saw-muſcles and the *Semiſpinatus*,which ſends a tendon into all the ribs. Others have their originall from many bones,and end in griſles of the ſeven ribs, as thoſe two which lye under the *Sternon*. Moreover alſo theſe differences of muſcles may be drawn from the originall and inſertion, that ſome proceed from bones, and are inſerted into the next bone, to help and ſtrengthen the motion thereof,as the three muſcles of the Hip: Others ariſe from an upper bone and are not inſerted into the next, but into ſome other, as the long muſcles. Some are named from the part they move,as the temporall muſcles, becauſe they move the temples; others from their office, as the grinding muſcles, becauſe they move the skin as a mill,to grinde aſunder the meal. From their form or figure, becauſe ſome are like Mice, other like Lizards which have their legs cut off, for that they imitate in their belly, body or tendon, the belly or tail of ſuch creatures, and from whence the names of *Muſculus* and *Lacertus* are derived. Such are thoſe which bend the wriſt, and which are faſtned to the bone of the Leg, and which extend the foot; others are triangular, as that which liſts up the arm, called *Epomis* or *Deltoides*, and that which draws the arm to the breſt,called the Pectorall muſcle. Others quadrangular, as the Rhomboides, or Lozenge-muſcle of the ſhoulder-blade,and the two hindeſom-muſcles ſerving for reſpiration, and two of the wriſts which turn down the hand; others conſiſt of more than four angles, as the oblique deſcending, and that muſcle which joins it ſelf to it from the ſhoulder-blade; others are round and broad, as the Midriff; others circular, as the Sphincter-muſcle of the fundament and bladder; others are of a pyramidicall figure, as the ſeventh muſcle of the ey, which compaſſes the optick nerve in beaſts but not in men. Others have a ſemicircular form, as that which ſhuts up the ey, ſeated at the leſſer corner thereof;others reſemble a Monks cowl, or hood, as the *Trapezius* of the ſhoulder-blade. Beſides others at their firſt originall are narrow, but broad at their inſertion, as the Saw-muſcle of the ſhoulder, and the tranſverſe of the *Epigaſtrium*; others are quite contrary, as the three muſcles of the Hip; others keep an equal breadth or bigneſs in all places,as the intercoſtall muſcles and theſe of the wriſt; others are long and ſlender,as the long muſcle of the thigh; others are long and broad, as the oblique deſcending muſcles of the *Epigaſtrium*; others are directly contrary, as the Intercoſtall, which are very narrow. From their perforations,for ſome are perforated, as the Midriff which hath three holes, as alſo the oblique and tranſverſe of the *Epigaſtrium*, that ſo they may give paſſage forth to the preparing ſpermatick veſſels, and to the ejaculatory veſſels, the Coat *Erythroides* aſſociating and ſtrengthening them; others are not perforated. From their magnitude, for ſome are moſt large, as the two muſcles of the Hip; others very ſmall, as the eight ſmall muſcles of the neck, and the proper muſcles of the Throtle, and the wormy muſcles. Others are of an indifferent magnitude. From their colour, for ſome are white and red, as the Temporall muſcles, which have tendons coming from the midſt of their belly; others are livid, as the three greater muſcles of the calf of the leg, which colour they have by the admixtion of the white, or tendinous nervie coat with the red fleſh, for this coat by its thickneſs darkning the colour of the fleſh, ſo that it cannot ſhew its redneſs and freſh colour, makes it ſeem of that livid colour. From their ſituation, for ſome are ſuperficiary, as thoſe which appear under the skin and fat; others deep in and hid, as the ſmooth and four twin muſcles; ſome are ſtretched

Where a Muſcle hath its originall.

Differences of muſcles from their inſertion.

Differences of Muſcles taken from their figure.

Differences from their perforations.

From their magnitude.

From their colour.

From their ſite.

ſtretched out, and (as it were) ſpred over in a ſtreight and plain paſſage, as the muſcles of the thigh which move the leg, except the Ham-muſcle; others oblique, as thoſe of the *Epigaſtrium*; otherſome tranſverſe, as the tranſverſe of the *Epigaſtrium*; where you muſt obſerve, that although all the fibers of the muſcles are direct, yet we call them oblique and tranſverſe, by comparing them to the right muſcles, as which by the concourſe of the fibers make a ſtreight or acute angle.

From their Fibers. From the ſorts of fibers; for ſome have one kinde of fiber; yet the greateſt part enjoy two ſorts running ſo up and down, that they either are croſſed like the letter X, as happens in the pectorall and grinding muſcles; or elſe do not concur, as in the Trapezii. Others have three ſorts of fibers, as the broad muſcle of the face.

From their connexion. From their coherence and connexion, or their texture of nervous fibers; for ſome have fibers ſomewhat more diſtant and remote immediatelyat their originall, than in other places, as you may ſee in the muſcles of the buttocks: Others in their midſt and belly, which by reaſon thereof in ſuch muſcles is more big or tumid, their head and tail being ſlender, as happens in moſt of the muſcles of the arm and leg, in which the denſe maſs of fleſh interwoven with fibers, disjoins the fibers in ſo great a diſtance; in otherſome the fibers are more diſtant in the tail, as in the greater Saw-muſcle ariſing from the bottom of the ſhoulder-blade; in others they are equally diſtant through the whole muſcle, as in the muſcles of the wriſt and between the ribs.

From their head. From their head; for in ſome it is fleſhy, interwoven with few fibers, as in the muſcles of the buttocks; in others it is wholly nervous, as in the moſt-broad-muſcle common to the arm and ſhoulder-blade, and in the three muſcles of the thigh proceeding from the tuberoſity of the hucle-bone; in ſome it is nervous and fleſhy, as in the internall and externall muſcle of the arm. Beſides, ſome have one head, others two, as the bender of the elbow, and the externall of the leg; others three, as the Threeheaded muſcle of the thigh. But we muſt note that the word Nerve or Sinew is here taken in a large ſignification, for a ligament, nerve and tendon, as *Galen* ſaith, (*Lib. de Oſſibus*) and moreover we muſt obſerve, that the head of a muſcle is one while above, another while below, otherwhiles in the midſt, as in the Midriff, as you may know by the inſertion of the Nerve, becauſe it enters the muſcle by its head.

From their belly. From their belly alſo, there be ſome differences of muſcles taken; for ſome have their belly immediately at their beginning, as the muſcles of the buttocks; others at their inſertion, as the Midriff; others juſt at their head, as thoſe which put forth the Calf of the leg; in others it is ſomewhat further off, as in thoſe which draw back the arm, and which bend the leg; in others, the belly extends even from the head to the tail, as in the intercoſtall muſcles, and theſe of the wriſt; in others it is produced even to their inſertion, as in thoſe of the palms of the hands and ſoles of the feet; ſome have a double belly diſtinguiſhed by a nervous ſubſtance; as thoſe which open the mouth, and thoſe which ariſe from the root of the lower proceſs of the ſhoulder-blade.

From their Tendons. Moreover the differences of muſcles are drawn alſo from the Tendons, for ſome have none, at leaſt which are manifeſt, as the muſcles of the lips and the ſphincter-muſcles, the intercoſtall and thoſe of the wriſt; others have them in part, and want them in part, as the Midriff; for the Midriff wants a Tendon at the ends of the ſhorter ribs, but hath two at the firſt *Vertebra* of the Loins in which it is terminated: Others have a Tendon indeed. But ſome of theſe move with the bone, ſome not, as the muſcles of the eys; and beſides, ſome of theſe have broad and membranous tendons, as the muſcles of the eys and *Epigaſtrium*, except the right muſcles: In others they are thick and round, as in the benders of the fingers; in others they are leſs round, but more broad than thick, ſuch is the Tendon ariſing from the twin muſcles and *Soleus* of the leg; others have ſhort Tendons, as the muſcles which turn down the hand; otherſome long, as thoſe of the palms of the hands, and ſoles of the feet; beſides others produce Tendons from the end of their belly, which Tendons are manifeſt; others from the midſt, as the Temporall muſcles.

Beſides alſo, others diffuſe many Tendons from their belly, as in the hands the benders of the fingers, and the extenders of the feet. Otherſome put forth but one, which ſometimes is divided into many, as thoſe which bend the third articulation of the foot; otherwhile many muſcles by their meeting together make one Tendon, as the three muſcles of the Calf of the leg, and thoſe which bend the cubit and leg. All Tendons have their originall, when the nerves and ligaments diſperſed through the fleſhy ſubſtance of a muſcle, are by little and little drawn and meet together, untill at laſt carried to the joint, they are there faſtned for the fit bending and extenſion thereof. From the contrariety of their Actions, for ſome parts have contrary muſcles, benders and extenders; other parts have none, for the Cods and fundament have only lifters up. From their function, for ſome are made for direct motions, as thoſe which extend the fingers and toes; others for oblique, as the Supinators of the hand, and the Pronators; others perform both, as the pectorall muſcle, which moves the Arm obliquely upward and downward, as the upper and lower fibers are contracted; and alſo outright, if all the fibers be contracted together, which alſo happens to the *Deltoides* and *Trapezius*. I have thought it good to handle particularly

From their action.

From their function.

larly these differences of muscles, because that by understanding them the prognostick will be more certain; and also the application of remedies to each part; and if any occasion be either to make incision, or suture, we may be more certain whether the part affected be more or less nervous.

CHAP. IX.

Of the parts of a Muscle.

HAving declared the nature and differences of a Muscle, we must note that some of the parts thereof are compound or universall, others simple or particular. The compound are the head, belly, and tail. The simple are ligaments, a nerve, flesh, a vein, artery and coat. For the compound parts, by the head, we understand the beginning and originall of a muscle, which is one while ligamentous and nervous, otherwhiles also fleshy. By the belly, that portion which is absolutely fleshy; But by the tail we understand a Tendon consisting partly of a nerve, partly of a ligament promiscuously comming forth from the belly of the muscle. For as much as belongs to the simple, which are six in number, three are called proper, and three common. The proper are a Ligament from a bone, a nerve proceeding from the Brain or spinall marrow, and flesh compact by the concretion of blood. The common are, a vein from the Liver or trunk arising from thence; an artery proceeding from the Heart, a Coat produced by the nervous and ligamentous fibers spreading over the superficies of the muscle. But for the simple use of all such parts, the nerve is (as it were) the principall part of a Muscle, which gives it sense and motion, the ligament gives strength, the flesh contains the nervous and ligamentous fibers of the Muscle, and strengthens it, filling up all the void spaces, and also it preserves the native humidity of these parts, and cherisheth the heat implanted in them; and to conclude, defends it from all externall injuries; for like a fan it opposeth it self against the heat of the Sun; and is as a garment against the cold; and is as a cushion in all fals and bruises; and as a buckler or defence against wounding weapons. The vein nourishes the muscle, the artery gives it life, the coat preserves the harmony of all the parts thereof, lest they should be any ways disjoined or corrupted by purulent abscesses breaking into the empty or void spaces of the Muscles, as we see it hapneth in a Gangrene, where the corruption hath invaded this membrane, by the breathing out of the more acrid matter or filth.

The compound and simple parts of a muscle.

What use each simple particle hath in a muscle.

CHAP. X.

A more particular inquisition into each part of a muscle.

HAving gone thus far, it remains, that we more particularly inquire into each part of a muscle, that (if it be possible) nothing may be wanting to this discourse. Wherefore a Ligament properly so called, is a simple part of mans body, next of a bone and grisle, the most terrestriall, dry, hard, cold, white, taking its originall immediatly, or by the interposition of some Medium from the Bones or Grisles (from whence also the Muscles have their beginning) whereby it comes to pass, that a ligament is void of sense, unless it receive a nerve from some other place; (for so the ligaments which compose and strengthen the tongue and yard, are partakers of sense, and it inserts it self into the bone and grisle, that so it may bind them together, and strengthen and beautifie the whole joint or connexion; (for these three be the principall uses of a ligament) then diffusing it self into the membranes and muscles to strengthen those parts. A Nerve, to speak properly, is also a simple part of our body, bred and nourished by a gross and phlegmatick humor, such as the brain, the originall of all the nerves, and also the Spinall marrow endued with the faculty of feeling, and oftentimes also of moving. For there be divers parts of the body which have nerves, yet are destitute of all voluntary motion, having the sense only of feeling, as the membranes, veins, arteries, guts, and all the entrails. A nerve is covered with a double cover from the two membranes of the brain, and besides also with a third proceeding from the ligaments which fasten the hinder part of the head to the *Vertebra's*, or else from the *Pericranium*. We understand no other things by the fibers of a Nerve, or of a Ligament, than long and slender threds, white, solid, cold, strong, more or less, according to the quantity of the substance, which is partly nervous and sensible, partly ligamentous and insensible. You must imagine the same of the fleshy fibers in their kinde; but of these threds some are streight for attraction; others oblique, for retention of that which is convenient for the creature; and lastly, some transverse, for expulsion of that which is unprofitable. But when these transverse threds are extended in length, they are lessned in bredth; but when they are directly contracted, they are shortned in length. But when they are extended all together as it were with an unanimous consent, the whole member

The nature of a Ligament.

The threefold use of a Ligament.

What a nerve is.

What we meant by the nervous and ligamentous fibers.

is wrinkled as contracted into it self, as on the contrary it is extended when they are relaxed. Some of these are bestowed upon the animall parts, to perform voluntary motions; others upon the vitall to perform the agitation of the heart and arteries; others upon the naturall for attraction, retention, and expulsion. Yet we must observe, that the attraction of no similar part is performed by the help of the foresaid fibers or threds, but rather by the heat implanted in them, or by the shunning of emptiness, or the familiarity of the substance. The flesh also is a simple and soft part, composed of the purer portion of the blood insinuating it self into the spaces between the fibers, so to invest them for the uses formerly mentioned. This is (as it were) a certain wall and bulwark against the injuries of heat and cold, against all falls and bruises, as it were a certain soft pillow or cushion yeelding to any violent impression. There be three sorts of flesh; one more ruddy, as the musculous flesh of perfect creatures, and such as have blood; for the flesh of all tender and young things having blood, as Calves, and also of all sorts of fish, is whitish, by reason of the too much humidity of the blood. The second kinde is more pallid, even in perfect creatures having blood, such is the flesh of the heart, stomach, weasond, guts, bladder, womb. The third is belonging to the entrails, or the proper substance of each entrail, as that which remains of the Liver (the veins, arteries and coat being taken away) of the bladder of the gall, brain, kidneys, milt: Some add a fourth sort of flesh which is spongy, and that they say is proper to the tongue alone.

By what power the similar parts, principally draw or attract.

What and of how many sorts the flesh is.

What a vein is.

A Vein is the vessel, pipe, or channel of the blood, or bloody matter; it hath a spermatick substance, consists of one coat composed of 3 sorts of fibers.

What an artery is.

An Artery is also the receptacle of blood, but that spirituous and yellowish, consisting in like manner of a spermatick substance; But it hath two coats with three sorts of fibers, the utmost whereof is most thin, consisting of right fibers, and some oblique: But the inner is five times more thick and dense than the utmost, interwoven with transverse fibers; and it doth not only contain blood and spirit, but also a serous humor, which we may beleeve because there be two emulgent Arteries as well as veins.

Why an artery is more thick and dense than a vein.

But the inner coat of an Artery is therefore more thick, because it may contain blood which is more hot, subtil, and spirituous; for the spirit, seeing it is naturally more thin and light, and in perpetuall motion, would quickly fly away, unless it were held in a stronger hold. There is other reason for a Vein, as that which contains blood gross, ponderous, and slow of motion. Wherefore if it had acquired a dense and gross coat, it could scarce be distributed to the neighbouring parts: God the maker of the Universe, foreseeing this, made the coats of the vessels contrary to the consistence of the bodies contained in them. The *Anastomasis* of the Veins and Arteries, that is to say, the application of the mouths of the one to the other, is very remarkable, by benefit of which they mutually communicate and draw the matters contained in them, and so also transfuse them by insensible passages, although that *anastomosis* is apparent in the Vein and Artery that meet together at the joint and bending of the arm, which I have sometimes shewed in the Physick schools, at such time as I there dissected Anatomies.

The mutuall Anastomosis of the veins and arteries. Where it is manifest.

From whence a muscle hath its beginning or head.

But the action or function of a Muscle is either to move or confirm the part according to our will, into which it is implanted; which it doth when it draws it self towards its originall, that is to say, its head. But we define the head by the insertion of the nerve, which we understand by the manner of the working of the Muscle.

CHAP. XI.

Of the muscles of the Epigastrium, or lower Belly.

NOw seeing that we have taught what a Muscle is, and what the differences thereof are, and what simple and compound parts it hath, and what the use, action, and manner of action in each part is; it remains that we come to the particular explication of each Muscle, beginning with those of the lower belly, as those which we first meet withall in dissection.

Eight muscles of the Epigastrium.

These are 8 in number, four oblique, two on each side, two right or direct, one on the right, another on the left side; and in like manner two transverse. All these are alike in force, magnitude and action, so mutually composed, that the oblique descendant of one side, is conjoined with the other oblique descendant on the other side, and so of the rest.

We may add to this number the two little Supplying or Assisting muscles, which are of a *Pyramidall* form, and arise from the Share-bone, above the insertion of the right muscles; Of the oblique Muscles of each side the one ascends, the other descends, whereupon it comes to pass, that they are called the Oblique descendant and ascendant Muscles. Those oblique which we first meet with, are the descendant, whose substance is partly sanguine, partly spermatick; for they are fleshy, nervous, ligamentous, veinous, arterious, and membranous. Yet the fleshy portion is predominant in them, out of which respect *Hippocrates* is wont to express the muscles by the name of fleshes; their greatness is indifferent

The oblique descendant. Their substance. Their greatnes and figure.

be-

between the large and the ſmall muſcles; their figure is three ſquare. They are compoſed of the forementioned parts, they are two in number; their ſite is oblique, taking their beginning from the touching of the great ſaw-muſcle, and from the ſixt and ſeventh true ribs, or rather from the ſpaces between the ſix lower ribs, and rather on the forepart of the muſcles, than of the ribs themſelves, from whence ſhunning the *Vertebra's* of the Loins, the fleſhy parts of them are terminated in the externall and upper eminency of the Haunch-bone, and the membranous end in the lower eminency of the Share-bone and the White-line. Yet *Columbus* diſſenting from this common deſcription of the oblique Muſcles, thinks that they are only terminated in the White-line, and not in the Share-bone. For (ſaith he) wherefore ſhould they be inſerted into the Share-bone which is not moved? But becauſe it would be an infinit labor and trouble to ſet down at large the ſeverall opinions of all Authors of Anatomy; I have thought it ſufficient for me to touch them lightly by the way. Their connexion is with the oblique aſcendant lying under them, and with the direct or right. Their temperament is twofold, the one hot and moiſt, by reaſon of the belly and the fleſhy portion of them; the other cold and dry, in reſpect of their ligamentous and tendinous portion. Their action is to draw the parts into which they are inſerted towards their originall, or elſe to unite them firmly. Yet each of theſe privately and properly draws the hip in an oblique manner towards the *Cartilago Scutiformis* or breſt-blade. Then follow the oblique aſcendant, who have the ſame ſubſtance, quantity, figure, compoſure, number and temper the deſcendant have. They are ſituate between the deſcendant and tranſverſe with whom they have connexion, eſpecially by the veſſels which are brought from the parts beneath. All the fleſhy parts ariſe from the rackbones of the Haunch to the ends of the baſtard ribs, which they ſeem to admit above and below, being fleſhy even to the fourth, and then becoming membranous, they take their way to the White-line, with a double *aponeuroſis*, which paſſes through the right Muſcles above and below, as we may plainly ſee from the navell downwards. In their fleſhy part they draw their original from the ſpine of the Haunch-bones a little lower than the deſcendent end in their fleſhy part. But for their membranous parts, they ariſe before from the ſharebone, but behinde from the ſpondyls of the Holy-bone, and *Vertebra's* of the Loins obliquely aſcending upwards to the White-line, into which they are terminated by an *aponeuroſis* or membranous tendon (which ſeems to penetrate the right Muſcle upwards and downwards, eſpecially under the navell) but by their fleſhy part at the ends of all the baſtard ribs, which they ſeem to receive above and below. And becauſe theſe muſcles are terminated in the White-line, they have alſo another uſe, yet ſuch as is common to all the muſcles of the *Epigaſtrium*, that is, to preſs down the Guts. Their action is (if they perform it together) to draw down the cheſt, and dilate the breſt; but if their actions be ſeparate, they draw the cheſt to the hip with an oblique motion. After theſe follow the right muſcles, ſo called becauſe they deſcend according to the length of the body, and becauſe they have right or ſtreight fibers.

Their compoſure and ſite.

Their connexion. Their temperament. Their action.

The oblique aſcendant. Their ſite and connexion.

Their action.

The right muſcles of the *Epigaſtrium*.

We will ſay nothing (to ſhun prolixity, which in all other places we will avoid) of their ſubſtance and other conditions, which they have common with the fore-mentioned Muſcles. They are ſituate in the eminenteſt or extuberating region of the belly, bounding the *Epigaſtrium* taken in generall, (or the ſuperficiary belly) they are divided by the manifeſt intercourſe of the White-line, even to the Navell, in which place they ſeem to be united even to the place of their inſertion. They draw their originall not from the Share-bone, as ſome would have it, but according to the inſertion of their nerves from the ſides of the *Cartilago ſcutiformis*, and the ends of the ſixth, ſeventh and eighth ribs; but they end in the Share-bone, where they make a common Tendon ſufficiently ſtrong and ſhort. *Sylvius*, *Veſalius*, and *Columbus* think they ariſe from the Share-bone, becauſe they cannot be inſerted into that bone, becauſe it is unmovable. You may perceive in theſe Muſcles certain nervous and tranſverſe interſections, oftentimes three in number for the ſtrength of theſe Muſcles, (of which *Galen* makes no mention, although they may be ſeen in Apes.) And alſo in the inner ſide of theſe muſcles you may ſee four veins, and as many arteries, of which ſome creep upwards, others run downwards. The upper, called the Mamillary, deſcend from the Axillary by the ſide and lower parts of the *Sternon*, the ſlenderer portions thereof being diſtributed by the way to the *Mediaſtinum*, and about the fourth and fift rib to the Dugs, from whence they take their name.

Their ſite.

Originall.

That which remains breaking out by the ſides of the Breſt-blade, inſerts it ſelf into thoſe muſcles, creeping along, even almoſt to the navell; in which place they are manifeſtly united (that is, the veins with the veins, and arteries with the arteries) with the Epigaſtrick, which aſcend from the upper part of the Iliacks on each ſide under the ſaid muſcles, untill they meet with theſe four mamillary veſſels. That you may finde this concourſe of the veins and arterics about the navell, you muſt follow both the upper and the lower ſomewhat deep into the fleſh, preſſing the blood on both ſides from above downwards, and from below upward, untill you ſhall finde the exoſculation of theſe veſſels, which will appear by this, That the blood will flow from this into that, and from that into this; otherwiſe you can ſcarce perceive it, by reaſon of the ſmalneſs of ſuch veſſels which want blood.

The meeting together of the Epigaſtrick and mamillary veins and arteries.

But

But that by the benefit of ſuch concourſe of the veſſels, the matters may be communicated and tranſported both from the womb to the dugs, and again from the dugs to the womb, appears in Nurſes who want their courſes, when the milk comes into their dugs; and on the contrary loſe their milk when their courſes flow plentifully. Otherwiſe to what purpoſe ſhould there be ſuch concourſe between the veſſels of the paps and womb? for there are veins and arteries diffuſed to the ſides of the womb from the root of the Epigaſtricks; for indeed the Epigaſtricks which in their aſcent meet with the mamillary, go not to the womb, though they be next to them, and ariſe from the ſame trunk with the Hypogaſtrick vein of the womb. The action of theſe Muſcles is, to move or draw near together the parts of the Hypogaſtrium to the *præcordia* or Hypochondries. Their uſe, in *Columbus* opinion, is, to draw the breſt downwards ſo to dilate it. At the ends of theſe, nature hath produced two other ſmall Muſcles from the upper part of the Share-bone, of a triangular figure, for the ſafety of the thick and common tendon of the right Muſcles; whereupon they are called *Succenturiati*, or aſſiſters.

Their action.

Their uſe.

The firſt figure of the Lower belly.

FIG. I

FIG. II.

A B C D. The upper, lower and laterall parts of the *Peritonæum.*

E E. The white Line from the griſtle of the Breaſt-bone, called the Breaſt-blade, to the commiſſure or meeting of the Share-bones.

F. The Griſtle of the Breaſt-bone, *Cartilago enſi-formis*, or the Breaſt-blade.

G. The Navell, which all the Muſcles being taken away, muſt be kept for the demonſtration of the Umbilicall Veſſels.

H H. The produſtions of the *Peritonæum*, which contain the ſeminary Veſſels on either ſide.

* * The hole which giveth way to the ſeminary Veſſels of men.

I I. A vein and an artery from the *Epigaſtrick*, which being carried upward under the right Muſcles, do here hang down, and are diſtributed into the lower part of the *Abdomen.*

K K. A Vein and an artery, from the internall Mammary proceeding from under the Bone of the Breaſt, are carried downward through the right muſcles, & are diſſeminated into the upper part of the *Abdomen.*

1, 2 the place wherein the right muſcles ariſe, which being here cut off, do hang down, that their Veſſels may the better be ſeen. 3, 4. The *Anaſtomaſis* or inoculation of the foreſaid Veſſels, making the conſent of the *Abdomen* and the Noſe, and of the Womb with the Breſts, as ſome think. L L. Branches of Veins running into the ſides of the *Peritonæum.* N. The place of the Haunch-bone bared, to which the Oblique and the Tranſverſe muſcles do grow.

The Pyramidal or aſſiſting Muſcles.

Some (moved with I know not what reaſon) would have theſe two ſmall Muſcles to help the erection of the yard. *Columbus* thinks they ſhould not be ſeparated from the right, and that they only are the fleſhy beginnings of the right. But on the contrary, *Fallopius* manifeſtly proves them different and ſeparate from the right, and ſhews their uſe.

The tranſverſe muſcles of the *Epigaſtrium.* Their figure and ſite.

The Tranſverſe remain to be ſpoken of, ſo called by reaſon of their fibers, which make right angles with the fibers of the right Muſcles. They have a quadrangular figure ſituate upon the greateſt part of the *Peritonæum*, to which they ſtick ſo cloſe that they ſcarce can be ſeparated. They take their originall from the production of the loins, the eminency of the Haunch-bone, the tranſverſe productions of the *vertebra's* of the loins, and the ends of the baſtard-ribs; contrary to the opinion of many, whom the inſertion of the nerve convinces, but they end in the White-line, as all the reſt do.

Their action. The common uſe and action of the eight muſcles of the *Epigaſtrium.*

Their action is to preſs the guts, eſpecially for the expulſion of excrements.

But all the eight recited Muſcles, beſides their proper uſe, have another common, that is, they ſtand for a defence or bulwark for all the parts lying under them, and ſerve for the expulſion both of the excrements, infant, and vapors, and alſo for the ſtrengthening

of

of the voice, as experience ſhews in thoſe who ſound Trumpets and Cornets.

Therefore theſe muſcles do equally on every ſide preſs the Belly; but the Midriff, the intercoſtall muſcles aſſiſting it, doth drive from above downwards, from which conſpiring contention follows the excretion of the excrements by the fundament; but unleſs the Midriff ſhould aſſiſt, theſe muſcles would preſs the excrements no more downwards, than upward to the mouth.

Why when the mouth is open the excrements go more ſlowly forth.

Although to this excretion of the excrements, it is not ſufficient that the Epigaſtrick, Midriff, and intercoſtall muſcles preſs the belly, but the muſcles of the throtle muſt be alſo ſhut. For the mouth being open, the excrements never go well forth; becauſe the vapors that paſs out of the mouth, which being reſtrained and driven to the Midriff, by ſtretching it powerfully thruſts down the excrement. Wherefore Apothecaries when they give glyſters, bid the Patient to open his mouth, that the glyſter may eaſily yer go up, which otherwiſe would ſcarcely go up, the mouth being ſhut, becauſe ſo we ſhould have no place empty in us, into which the glyſter might be admitted.

Of the White-line, and Peritonæum or Rim of the belly.

What the White-line is.

THe White-line is nothing elſe, than the bound and extremities of the muſcles of the *Epigaſtrium*, diſtinguiſhing the belly in the midſt into two parts, the right and left. It is called white, both of its own colour, and alſo for that no fleſhy part lyes under it, or is placed above it. It is broader above the navell, but narrower below, becauſe the right muſcles do there grow into one. Now we muſt treat of the Coat or membrane, *Peritonæum* or Rim of the belly; it is ſo called, becauſe it is ſtretched over all the lower belly, and particularly over all the parts contained in the ventricle, to which alſo it freely lends a common coat. It hath a ſpermatick ſubſtance, as all other membranes have; the quantity of it in thickneſs is very ſmall, (for it is almoſt as thin as a Spiders web) yet differing in divers places in men and women; for men have it more thick and ſtrong above the navell, that ſo it may contain the extenſion of the ſtomack, often ſtretched beyond meaſure with meat and drink. On the contrary women have it ſo thick and ſtrong below their navell, that it ſeems double, that ſo they may more eaſily endure the diſtention of their womb, cauſed by the childe contained in it. But above the navell, men and women have the *Peritonæum* of an equal ſtrength, for the ſelf-ſame reaſon. The longitude and latitude of it is known by the circumſcription of the belly.

What the Peritonæum is.

The ſubſtance, and quantity.

The figure.

The figure is round and ſomewhat long; it puts forth ſome productions, like finger-ſtalls, both for the leading and ſtrengthening the ſpermatick veſſels, and the Cremaſter muſcles of the Teſticles, and beſides it the ejaculatory veſſels, as alſo to impart a coat to the Teſticles and all the naturall parts.

The compoſition.

It is compoſed of ſlender, membranous and nervous fibers, certain ſmall branches of veins and arteries concurring with them, which it receives for life and nouriſhment from the adherent parts.

The number. Lib. de ſem.

This membrane is one in number, and beſides every where one and equal, although *Galen* would have it perforated in that place where the ſpermatick veſſels deſcend to the Teſticles; But in truth we muſt not think that a hole, but rather a production, as we ſaid before.

The later Anatomiſts have obſerved, the Coat *Peritonæum* is doubled below the Navel, and that by the ſpaces of theſe reduplications the umbilicall arteries aſcend to the Navell.

The ſite and connexion.

It is ſituate near the naturall parts, and compaſſes them about, and joined by the coat, which it gives them, as alſo on the ſides, it is joined to the *vertebra's* of the loins, from whoſe ligaments (or rather Perioſteum) it takes the originall: On the lower part, it cleaves to the ſhare-bone, and on the upper to the Midriff, whoſe lower part it wholly inveſts; on the fore or outer part it ſticks ſo cloſe to the tranſverſe muſcles, that it cannot be pluckt from them but by force, by reaſon of the complication and adhæſion of the fibers thereof with the fibers of the proper membrane of theſe muſcles, which membrane in *Galens* opinion proceeds from this *Peritonæum*, that ſo it is no marvail that we may more eaſily break than ſeparate theſe two coats. It is of temperature cold and dry, as all other membranes are. Lib. 6. Meth.

Uſe.

It hath many uſes, the firſt whereof is, to inveſt and cover all the parts of the lower belly, ſpecially the Kall, leſt it ſhould be ſqueezed by great compreſſures and violent attempts into the empty ſpaces of the muſcles, as it ſometimes happens in the wounds of the *Epigaſtrium*, unleſs the lips of the ulcer be very well united; for then appears a tumor about the wound by the Guts and Kall thruſting without the *Peritonæum* into thoſe ſpaces of the muſcles; from whence proceeds cruel pain.

Another uſe is to further the caſting forth of the excrements by preſſing the ventricle and guts on the foreſide, as the Midriff doth above, as one ſhould do it by both their hands joined together.

The third uſe is, it prohibits the repletion of the parts with flatulency after the expulſion of the excrements, by ſtraitning and preſſing them down.

The fourth and laſt is, that it contains all the parts in their ſeat, and binds them to the back-bone, principally that they ſhould not fly out of their places by violent motions, as leaping and falling from on high.

Lastly, we must know, that the Rim is of that nature, that it will easily dilate it self, as we see in Dropsies, in women with childe, and in tumors against nature.

CHAP. VIII.

Of the Epiploon, Omentum, or Zirbus, that is, the Kall.

The substance, magnitude, figure.

After the containing parts, follow the contained, the first of which is the *Epiploon*, (or Kall) so called, because it (as it were) swims upon all the guts. The substance of it is fatty and spermatick, the quantity of it for thickness is diverse, in divers men according to their temperament. The latitude of it is described by the quantity of the guts. It is in figure like a purse, because it is double. It is composed of veins, arteries, fat and a membrane, which sliding down from the gibbous part of the ventricle, and the flat part of the gut *Duodenum* and spleen over the Guts, is turned back from the lower belly to the top of the Colon. It is one as we said covering the Guts. It

The composure.

hath its chief connexion with the first *Vertebra's* of the Loins, from which place in beasts it seems to take a coat, as in men from the hollow part of the Spleen, and gibbous of the ventricle, and depressed part of the *Duodenum*, from whence doubled it is terminated in the fore and higher part of the Colick-gut. Which moved *Galen* to write, that the upper part of the membrane of the Kall was annexed to the ventricle; but the lower, to the laxer part of the Colick-gut. From the vessels of which parts it borrows his, as also the nerves, if it have any. The temper of it in lean bodies is cold and dry, because their Kall is without fat; but in fat bodies it is cold and moist by reason of the fat. The use of it is two-fold: The first is to heat and moisten the Guts, and help their concoction, although it do it by accident, as that which through the density of the fat hinders the cold air from piercing in, and also forbids the dissipation of the internall heat. Another use is, that in want of nourishment in times of great famin, for sometimes it cherishes, and (as it were) by its dew preserves the innate heat, both of the ventricle and neighbouring parts, as it is written by *Galen*. Moreover we must observe, that in a rupture or relaxation of the *Peritoneum*, the Kall fals down into the *scrotum*, from whence comes that rupture we call *Epiplocele*. But in women that are somewhat more fat, it thrusts it self between the bladder and the neck of the womb, and by its compression hinders, that the seed comes not with full force into the womb, and so frustrates the conception. Besides, when by a wound or some other chance, any part of it be defective, then that part of the belly which answers to it, will afterwards remain cold and raw, by reason of the forementioned causes.

Lib. Anatom. administ.

The temper.

The use two-fold.

Lib. 4. de usu partium.

A cause of frustrating conception.

The second figure of the lower belly.

A A, B B. The inner part of the *Peritoneum* cut into four parts, and so turned backward.

B. The upper *B* sheweth the implantation of the Umbilicall vein into the Liver.

C. The Navel separated from the *Peritoneum*. From *D* to the upper *B* the Umbilicall veins.

E, E. The forepart of the stomach blown up, neither covered by the Liver nor Kall.

F, F. A part of the *Gibbous* side of the Liver.

G. Vessels disseminated through the *Peritoneum*. * The Brest blade.

H. The bottom of the Bladder of urine.

I. The connexion of the *Peritoneum* to the bottom of the Bladder.

K, K, K, K. The Kall covering the Guts.

M, N. Vessels and sinews embracing the bottom of the stomach.

O. The meeting of the Vessels of both sides; so that *M, N*, and *O*, shew the seam which *Aristotle* mentions, 3 *Hist.* & 4 *de part. Anim.* where he saith, That the Kall arises and proceeds from the midst of the belly.

P, P. Branches of Vessels running alongst the bottom of the stomach.

Q Q Q Q. Certain branches of the Vessels distributed to the upper membrane of the *Omentum*, and compassed with fat.

a, a. The two Umbilicall arteries going down by the sides of the bladder to a branch of the great artery.

b The Ligament of the Bladder which is shewed for the *Urachus*.

CHAP.

CHAP. XIIII.

Of the Ventricle or Stomach.

NOw we must speak of the Stomach, the receptacle of the food necessary for the whole body, the seat of appetite, by reason of the Nerves dispersed into its upper orifice, and so into its whole substance. The substance thereof is rather spermatick than sanguine, because that for one fleshy membrane, it hath two nervous; The quantity or magnitude of the ventricle is divers, according to the various magnitude of bodies, and gluttony of men. The figure of it is round and somewhat long, like a Bagpipe. The stomach is composed of two proper coats, and one common from the *Peritonæum*, together with veins, sinews, and arteries; the innermost of its proper coats is membranous woven with right fibers, for the attraction of meats, it is extended and propagated even to the mouth thereof, whereby it comes to pass that the affections of one part may easily be communicated to the other by sympathy, or consent. This coat hath its originall from the membranes of the brain which accompany the nerves descending from the third and fourth conjugation to the mouth thereof. And in like sort from other productions descending by the passages of the head, from whence also another reason may be drawn from that, which they commonly bring from the nerves of the sixt conjugation; why in wounds of the head, the stomach doth so soon suffer by consent with the brain. The exterior or outer is more fleshy and thick, woven with oblique fibers, to retain and expell. It draws it originall from the *Pericranium*, which as soon as it comes to the gullet, takes unto it certain fleshy fibers. There be nerves sent into the stomach from the sixt conjugation of the brain, as it shall be shewed in its proper place. Veins and arteries are spread into it from the *Gastrica*, the *Gastrepiploides*, the *Coronaria* and splenick, from the second, third, and fourth distribution of the *Vena porta*, or gate-vein; and the third of the descendent artery to the naturall parts, as soon as it passes forth of the midriffe.

What the ventricle is.
The substance.
The magnitude.
The figure.
The compositure.
The cause of the consent of the mouth and stomach.

It is one in number. The greater part of it is situated on the left side between the spleen, the hollowness of the liver, and the guts, that assisted by the heat of such neighbouring parts, it may more cheerfully perform the concoction of the meat. Neither am I ignorant that *Galen* hath written, that a great part of the stomach lies on the left side. But inspection it self, and reason makes me derogate from *Galens* authority, for because there is more empty space on the left side, by reason the spleen is less than the liver, it was fit it should lie more on the left side. The more proper connexion of it is with the gullet and guts, by its two orifices; with the brain by its nerves; with the liver and spleen by its veins; with the heart by its arteries; and with all the naturall parts by its common membrane.

The number.
Lib. 4. de usu partium.
The connexion.

The temper of the ventricle in men of good habit, is temperate, because it is almost composed of the equall commixture of sanguine and spermatick parts; or according to *Galens* opinion, it is cold of its self, and by the parts composing it; and hot by the vicinity of the bowels. But in some it is hotter, in others colder, according to the divers temper and complexion of divers bodies. That stomach is to be thought well tempered, that powerfully draws down the meat and drink, and embraces and retains them so drawn, untill by concoction and elixation, they shall be turned into a juice like cream (which the Greeks call *Chylos*;) and lastly, which doth strongly send from it, and repell the excrements of this first concoction.

The temper.
Lib. 9. Meth.

The stomach is known to be hotter by this, that it better concocts and digests course and hard meats, as beef, hard egs, and the like, than soft meats easie of digestion, which it corrupts and turns into belchings. For so a young chickin, is sooner burnt than well rosted at a great fire. The stomach which is colder, desires much meat, but is slow in concocting them, especially if they be cold and hard of digestion, which for that cause quickly turn sowre. The action of a well conditioned stomach is twofold, one common, another proper. The common is to attenuate, mixe and digest the meats taken in at the mouth, for the nutrition of it self and the whole body, after the liver hath performed its duty, which before it be done, the ventricle only enjoyes the sweet pleasure of the *Chylus*, and comforts its self against the impurity of the adjacent parts, whereof it is called the work-house of concoction. Its first action is to attract, retain, and assimilate to it self that which is convenient; but to expell whatsoever shall be contrary, either in quantity, or quality, or in the whole substance.

Notes of a hot stomach.
The action twofold.

It hath two orifices, one above, which they commonly call the stomach and heart, the other lower, which is called the *Pylorus*, or lower mouth of the stomach. The upper bends to the left side neer the back bone; it is far more large and capacious than the lower, that so it may more commodiously receive meats half chewed, hard and gross, which Gluttons cast down with great greedinesse; it hath an exquisite sense of feeling, because it is the seat of the appetite, by reason of the nerves incompassing this orifice, with their mutuall imbracings; whereby it happens that the ventricle in that part is endued with a quick sense, that perceiving the want and emptiness of meat, it may stir up the creature to seek food. For albeit nature

The two orifices of the stomach.

nature hath beſtowed four faculties on other parts, yet they are not ſenſible of their wants, but are only nouriſhed by the continuall ſucking of the veins, as plants by juice drawn from the earth.

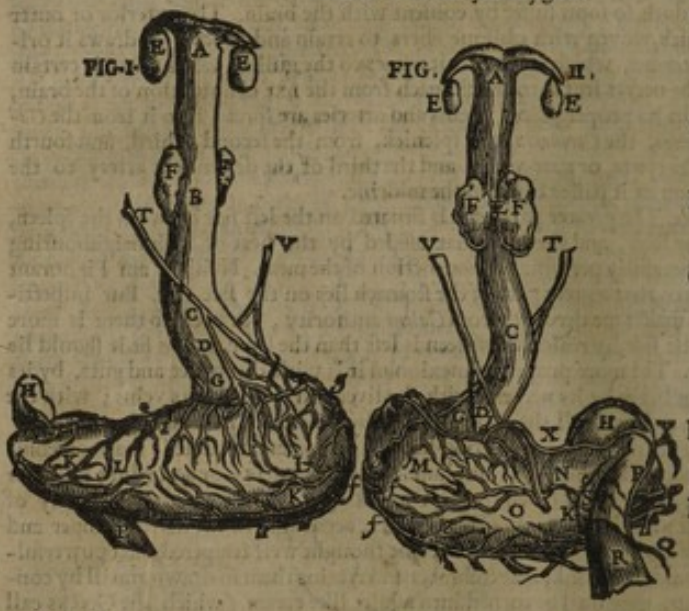
The ſite.

This orifice is ſeated at the fifth *Vertebra* of the cheſt, upon which they ſay it almoſt reſts. Yet I had rather ſay that it lies upon the twelfth *Vertebra* of the cheſt, and the firſt of the loins; for in this place the gullet perforates the midriffe, and makes this upper orifice. The lower orifice bends rather to the right ſide of the body, under the cavity of the liver. It is far ſtraiter than the upper, leſt any thing ſhould paſs away before it be well attenuated and concocted; and it doth that by the help or aſſiſtance of, as it were, a certain ring, like to the ſphincter muſcle of the fundament, which ſome have thought a glandule made by the tranſpoſition of the inner and fleſhy membrane of the ventricle into that which is the outer of the guts. I know *Columbus* laughs at this glandulous ring, but any one that looks more attentively ſhall perceive that the *Pylorus*, is glandulous. The ſtomach in its lower and inner ſide, hath many folds and wrincles, which ſerve to hold and contain the meats, untill they be perfectly concocted. In the ventricle we obſerve parts gibbous and hollow; the hollow is next to the liver and midriffe; the gibbous is towards the guts. Now we muſt note, that the ventricle when it is much reſolved or looſed, may ſlide down even to the navill near the bladder, the which we have obſerved in ſome bodies diſſected after their death.

The glandulous ring of the *Pylorus*.

The falling down of the ſtomach.

The third and fourth figure.



The firſt figure ſhews the fore-ſide of the ſtomach and gullet.

A. ſheweth the orifice of the gullet cut from the throat.

B. the ſtraight and direct courſe of the gullet from A. to B.

C. how the gullet above the firſt rack bone of the cheſt, from B. to C. inclineth to the right hand.

D. his inclination to the left hand, from C. to D.

EE. the two glandules called the Almonds, ſet cloſe to the gullet in the end of the throat, called alſo *Pariſtmia*, *Antiades*, *Tonſillæ* and *Salviares glandulæ*. FF. Another glandulous body in the midſt of the gullet, about the fifth rack bone, from which place the gullet gives place to the great arterie, ſomewhat declining to the right ſide: *Veſalius*, *Lib.* 5. *Cap.* 3. and *Columbus Cap. ult. lib.* 9. write, that thoſe Glandules are filled with a certain moiſture, with which the gullet is moiſtened, that the meats may ſlide down more eaſily into the ſtomach, as through a ſlippery paſſage. No otherwiſe than the *Glandulæ proſtatæ*, filled with a kind of groſs and oily moiſture, ſmooth the paſſage of the urine, that ſo it may flow through it, with a more free and leſs troubled courſe. G. the connexion of the gullet with the ſtomach, where the upper orifice of the ſtomach is faſhioned. H. the lower orifice of the ſtomach called *Pylorus*. I. K. the upper part of the ſtomach at I. the lower at K. LL. the fore-ſide of the ſtomach. P. the gut called *Duodenum*. T. V. the right and left nerves of the ſixth pair encompaſſing about the gullet and the uppermoſt left orifice of the ſtomach.

The ſecond Figure ſheweth the back parts of the Ventricle and Gullet.

A. EE. FF. G. H. P. TV. ſhew the like parts as in the former. From C. to D. the inclination of the ſtomach to the left hand. M. N. O. the backſide of the ſtomach. M. ſheweth the prominence of the left ſide. N. of the right. O. ſheweth the dock or impreſſion, where it reſteth upon the rack bones. Q. R. the paſſage of the bladder of the gall into the *Duodenum* at R. S, a glandulous body growing under the *Duodenum*, bearing up the veſſels X. Y. a nerve on the left ſide creeping up to the top of the ſtomach, and ſo running out to the liver.

CHAP.

CHAP. XV.
of the Guts.

THe Guts the instruments of distribution and expulsion, are of the same substance and composure with the stomach, but that the site of the coats of the stomach is contrary to those of the guts. For that which is the innermost coat of the stomach is the outermost of the guts, and so on the contrary. The figure of the guts is round, hollow and capacious, some more, some less, according to the divers bigness. *Their substance.* *Figure.*

But for the quantity of the guts, some are small, some great, more or less, according to the variety of bodies. But they are six in number: for there be three small; the *Duodenum*, the *Jejunum*, or empty gut, and the *Ileon*. Three great, the Blind, the Colick, and the Right gut. All which have had their names for the following reasons; the first, because it is extended the length of twelve fingers, like another stomach, without any turning, or winding; of which greatness it is found in great bodied men, such as were more frequently to be met withall in *Galens* time, than in this time of ours, in which this gut is found no longer than seven, eight, or nine fingers at the most. The cause of this length is, that there may be a free passage to the Gate-vein, coming out of the liver, as also to the artery and nerve which run into it. For seeing that this gut may sometimes rise to the top of the liver, it would possess the space under the bladder of the gall (with which it is often tinctured) if it had any revolutions that way, which is the passage for such like vessels. Others give another reason of this figure, which is, that there should be nothing to hinder the easie and fit distribution of the perfectly concocted *Chylus* to the liver. *Their number* *The Duodenum.*

The second is called *Jejunum*, or the empty gut, not because it is absolutely so, but because it contains little in comparison of the other. There is a triple cause of this emptiness, the first the multitude of the meseraick veins and arteries which are about it, whereupon there is a greater and quicker distribution of the *Chylus*. The second is the vicinity or neighborhood of the liver strongly drawing the *Chylus* contained in it; the third is the flowing down of the chollerick humor from the bladder of the Gall into it, which ever and anon by its acrimony cleanses away the filth, and by continuall flowing solicits it to expulsion. The third is called *Ileon* because it lies between the *Ilia* or flanks; it differs nothing from the rest in substance and magnitude, but in this one thing, that there is more matter contained in it than in the rest, by reason of the paucity of the vessels terminated in it, that it is no marvell that there can be no exact demonstration made of them. The fourth is called *Cecum* or the blind, because it hath but one passage to send out and receive in the matter. This gut hath a long and strait production, which according to the opinion of some (though altogether erroneous) often falls down into the *Scrotum* in the rupture, or relaxation of the Rim of the Belly; for that production in the lower belly strongly sticks to the *Peritoneum* or Rim, which hinders such falling down. But *Galen* seems by such a blind gut to have meant this long and narrow production, and certainly so thinks the common sort of Anatomists, but here *Vesalius* justly reprehended *Galen*. Wherefore *Sylvius* that he might free *Galen* of this fault, would have us by the blind gut to understand the beginning of the colick gut. The fifth is called *Colon* (or colick gut) because it is greater and more capacious than the rest. The sixt and last, the Right gut, by reason of the rightness or streightness of the passage. This, in beasts especially, hath a certain fatness in it to make the passage slippery, and lest the gut should be exulcerated in the passage, by the sharpness of hard and acrid excrements. *The Jejunum.* *Ileon.* *Cecum.* *Colon.* *Rectum.*

The site of these guts is thus: The *Duodenum* upon the backbone bends to the right hand; the *Jejunum* possesses a great part of the upper umbilicall region, diffuses it self into both sides with windings, like to these of the gut *Ileum*, even to the flanks. The gut *Ileon* is situate at the lower part of the umbilicall region, going with many turnings and windings, even to the hollowness of the holy-bone above the bladder and side parts of the *Hypogastrium*, they call the flanks. *Their site.*

The Blind bends to the right hand, a little below the kidney, above the first and fourth *Vertebra* of the loins. The Colon or Colick gut is crooked and bent, in the form of a *Scythian* bow, filling all the space from the blind gut, below the right kidney even to the hollowness of the liver, and then it goes by the gibbous part of the stomach above the small guts, even to the hollowness of the Spleen; from whence sliding under the left kidney, with some turnings, it is terminated upon the *Vertebra's* of the loins.

By all which turnings and windings of the colick gut, it is easie to distinguish the pain of the stone of the kidneys, which remain fixt in one certain place, from the colick wandring through these crooked passages we mentioned. The right gut tends with an oblique site towards the left hand, upon the holy bone even to the very fundament. They have all one and a common connexion; for they are all mutually joined together by their coats, because there is but one way from the gullet even to the fundament, but they are joined to the principall parts by their nerves, veins, and arteries. *The distinction between the colick and the stone in the kidneys.* *Their connexion.*

But a more proper connexion is that, where the *Duodenum* on the upper part of it, is joined

ed with the *Pylorus*; but on the lower part to the *Jejunum*, and the parts lying under it, by the coat of the *Peritonæum*. The *Jejunum*, or empty gut, is joyned to the *Duodenum* and *Ileon*. The *Ileum* with the empty and blind guts. The blind with the *Ileon* and *Colon*, and with the right side of the backbone where it is tied more straitly. The *Colon* with the blind and right guts, and in his middle part, with the kidneys and gibbous part of the stomach; whereby it comes to pass, that being distended with wind in the colick, it overturns and presses the stomach, and so causes vomiting.

Why vomiting happens in the colick.

Lastly, the right gut is annexed with the colick gut and fundament. At the end whereof there is a muscle fastened, of figure round and circular, called the *Sphincter*, arising from the lower *Vertebra's* of the holy bone and rump, by the benefit of which as of a dore or gate, the excrements are restrained at our wil, lest man born for all honest actions, without all shame, in every time and place, should be forced every where to ease his belly. For such as have lost the benefit of this muscle by the palsy, have their excrements go from them against their wills. There is a body situate at the end of the right gut, of a middle substance between the skin and flesh, as it were arising from the mixture of them both, like the extremities of the lips, of the same use with the *Sphincter*, but that it is not altogether so powerfull. But there are also certain veins situate about it called the Hæmorrhoidall, of which we will speak in their place.

The *Sphincter* muscles of the fundament.

Gal. lib. 5. de usu partium. cap. 14.

Besides there are two other muscles that descend to the end of this gut, being broad and membranous on each side, one arising from the side and inner parts of the share and hip-bones, which inserted above the *Sphincter* pull up the fundament falling down, wherefore they are called *Levatores Ani*, or the lifters up of the fundament. Wherefore when as either they are too weak, or resolved, or the fundament oppressed with the weight of flegmatick, salt, cholerick and sharp humors, the gut is scarce restored into its place, that there is need of the help of the fingers for that purpose.

Levatores Ani.

The guts follow the temper of the stomach. Their action is the distributing the *Chylus* by the meseraick veins (which of duty belongs to the three small guts) and the receiving the excrements of the *Chylus*, and retention of them, till a fit time of expulsion, which belongs to the third quarter. Besides, these small guts finish up the work of concoction, begun in the stomach, although they be not altogether made for that use. But nature is often accustomed to abuse the parts of the body for some better use.

The action of the guts.

The fifth figure of the lower belly.

A. The brest blade, *Cartilago, Ensiformis.*
BB. The Rim, with the midriffe and broken ribs bent outwards.
CC. the gibbous part of the liver.
D. a ligament tying the liver to the midriffe.
E. part of the umbilicall vein.
FF. the stomach fild full of meat.
G. a part of the spleen.
H. the blind gut of the late writers, for the Ancients took the top of the *colon* for it.
I. the beginning of the great or thick guts.
I. and so to K. sheweth the passages of the colick gut from the right kidney to the liver. And so the colick and the stone on this side are in one place, and therefore hardly distinguished.
K. to L. the same colick gut lyeth under the whole bottome of the stomach, which is the reason that those which are troubled with the colick cast so much.
L. to M. The passage of the *Colon* from the spleen to the share bone, by the left kidney, a way, which maketh the pain of the stone and the Colick on the left side very hard to distinguish. N. The *Colon* ending in the right gut. O. The beginning of the right gut unto the bladder. P. Q. The sunken or fallen side of the *Colon* at P. and his Chambers or Cels at Q. R. S. T. The lesser guts especially lying under the Navel. *a. a.* The two umbilicall arteries. *b.* The bottome of the bladder. * The connexion of the bladder and the *Peritonæum.*

But

But we must note, that for the composure of the guts, they have only transverse fibers, for expulsions sake, unless that at the beginning of the *Colon*, and the end of the right gut, you may see certain right fibers added to the transverse to strengthen them, lest these guts should chance to be broken and torn by the passage of hard excrements, and the laborious endeavour of expulsion (specially in brute beasts.) Their fibers.

But if any aske, how they have retention, being they want oblique fibers; he may know that the *feces* are retained in the right gut, by the force of the *Sphincter* muscle, but oft times in the blind, by their hardness and abundance, whereby they stick in the passage; but in the rest, by reason of their conformation into many windings and turnings. The length of the guts, is seven times more than the length of the whole body; to this length they have windings, lest the nourishment should quickly slide away, and left men should be withdrawn by gluttony from action and contemplation. For so we see it comes to pass in most beasts, which have one Gut, stretched streight out from the stomach to the fundament; as in the Lynx and such other beasts of insatiable gluttony, alwayes, like plants, regarding their food. How the guts become fit to retain. The ir length.

CHAP. XVI.

Of the Mesentery.

After the Guts followes the Mesentery, being partly of a fatty and partly of a spermatick substance. The greatness of it is apparent enough, although in some it be bigger, and in some lesser according to the greatness of the body. It is of a round figure and not very thick. It is composed of a double coat arising from the beginning and root of the *peritonæum*. In the midst thereof it admits nerves from the Costall of the sixt conjugation, veins from the *Vena Porta* or Gate vein; Arteries from the descendent artery, over and besides a great quantity of fat and many glandulous bodies, to prop up the division of the vessels spred over it, as also to moisten their substance. It is in number one, situate in the middle of the guts, from whence it took its name. Yet some divide it into two parts, to wit, into the *Meseraum*, that is, the portion interwoven with the small guts, and into the *Mesocolon* which is joyned with the Great. It hath connexion by its vessels, with the principall parts, by its whole substance with the guts, and in some sort with the kidneys, from whose region it seems to take its coats. The substance, Magnitude. Figure. Composure. Number. The connexion.

It is of a cold and moist temper, if you have respect to his fatty substance; but if to the rest of the parts, cold and dry. The temper.

The action and use of it is, to bind and hold together the guts, each in his place, lest they should rashly be folded together, and by the Meseraick veins (which they term the hands of the Liver) carry the *Chylus* to the liver. The action and use.

In which you must note, that all the Meseraick Veins come from the liver, as we understand by the dissection of bodies; although some have affirmed, that there be some veins serving for the nourishment of the guts, no wayes appertaining to the Liver, but which end in certain Glandulous bodies, dispersed through the Mesentery, of whose use we will treat hereafter. All the meseraick veins come from the liver.

CHAP. XVII.

Of the Glandules in generall, and of the Pancreas, *or sweet-bread.*

A Glandule is a simple part of the body, sometimes of a spungy and soft substance, sometimes of a dense and hard. Of the soft Glandules are the *Tonsille*, or Almonds, like in substance to blanched Almonds; the *Thymus*, *Pancreas*, *Testicles*, *Prostatæ*. But the dense and hard are the *Parotides* and other like. The Glandules differ amongst themselves in quantity and figure, for some are greater than other some, and some are round and others plain, as the *Thymus* and *Pancreas*. Substance of the glandules. Quantity and figure.

Others are compounded of veins, nerves, arteries, and their proper flesh, as the Almonds of the ears, the milky glandules in the breasts and the testicles. Others want nerves, at least which may be seen, as the *Parotides*, the axillary, or those under the armholes and others. The number of glandules is uncertain, by reason of the infinite multitude and variety of sporting nature. You shall find them alwayes in these places, where the great divisions of vessels are made; as in the middle ventricle of the brain, in the upper part of the Chest, in the Mesentery and other like places. Composition. Number.

Although otherwhile be seated in such places, as nature thinks needfull to generate and cast forth of them a profitable humor to the creature; as the almonds at the root of the tongue, the kernels in the dugs, the spermatick vessels in the *scrotum* and at the sides of the wombe; or where nature hath decreed to make emunctories for the principall parts,

as

Connexion. as behind the ears, under the armholes, and in the groins. The connexion of glandules is not only with the veſſels of the parts concurring to their compoſition, but alſo with thoſe, whoſe diviſion they keep and preſerve. They are of a cold temper, wherefore Phyſitians ſay the blood *recrudeſcere (i)* to become raw again in the dugs, when it takes upon it the form of milk. But of theſe ſome have action, as the almonds, which pour our ſpatle uſefull for the whole mouth, the dugs milk, the Teſticles ſeed; others, uſe only, as thoſe which are made to preſerve, underprop and fill up the diviſions of the veſſels. Beſides this we have ſpoken of glandules in generall, we muſt know that the *Pancreas* is a glandulous and fleſh-like body, as that which hath every where the ſhape and reſemblance of fleſh. It is ſituate at the flat end of the liver, under the *Duodenum* with which it hath great connexion, and under the gate-vein, to ſerve as a bulwarke, both to it and the diviſions thereof, whilſt it fils up the empty ſpaces between the veſſels themſelves, and ſo hinders, that they be not pluckt aſunder, nor hurt by any violent motion, as a fall or the like.

Temper. Action and uſe.

The ſubſtance of the *Pancreas*.

The ſite.

CHAP. XVIII.

Of the Liver.

HAving gone thus far, order of diſſection now requires, that we ſhould treat of the diſtribution of the gate-vein; but becauſe it cannot well be underſtood unleſs all the nature of the liver from whence it ariſes, be well known, therefore putting it off to a more fit place, we will now ſpeak of the Liver. Wherefore the Liver (according to *Galens* opinion, *lib. de form. fœtus*) is the firſt of all the parts of the body, which is finiſhed in conformation, it is the ſhop and Author of the blood, and the originall of the veins; the ſubſtance of it, is like the concrete mud of the blood, the quantity of it is divers, not only in bodies of different, but alſo of the ſame ſpecies; as in men amongſt themſelves, of whom one will be gluttonous and fearfull, another bold, and temperate, or ſober; for he ſhall have a greater liver than this, becauſe it muſt conceive and concoct a greater quantity of *Chylus*: yet the liver is great in all men, becauſe they have need of a great quantity of blood for the repairing of ſo many ſpirits and the ſubſtantifick moiſture, which are reſolved and diſſipated in every moment by action and contemplation. But there may be a twofold reaſon given, why ſuch as are fearfull have a larger liver. The firſt is, becauſe in thoſe the vitall faculty (in which the heat of courage and anger reſides) which is in the heart, is weak, and therefore the defect of it muſt be ſupplyed by the ſtrength of the naturall faculty. For thus nature is accuſtomed to recompence that which is wanting in one part, by the increaſe and acceſſion of another. The other reaſon is, becauſe cold men have a great appetite, for by *Galens* opinion *In arte parva*, coldneſs increaſes the appetite; by which it comes to paſs that they have a greater quantity of *Chylus*, by which plenty the liver is nouriſhed and grows larger. Some beaſts, as Dogs, and ſwine, have the liver divided into five or more Lobes, but a man hath but one Lobe, or two, or three at the moſt; and theſe not ſo much diſtinguiſhed, as which cheriſh the upper and hollow region of the ventricle, with embracing to help forward the work of concoction. Therefore the liver is almoſt content with one Lobe, although it is alwayes rent with a ſmall diviſion, that the umbilicall vein piercing into the roots and ſubſtance of it, may have a free paſſage; but alſo oftentimes there is as it were a certain ſmall lobe of the liver, laid under that umbilicall vein, as a cuſhion.

What the liver is.

Its ſubſtance and quantity.

Why cowards have great livers.

The figure of the liver is gibbous; riſing up and ſmooth towards the Midriffe; towards the ſtomach is the *ſinous* or hollow ſide of it ſomewhat unequall, and rough by reaſon of the diſtance of the Lobes, the original of the hollow vein, and the ſite of the bladder of the Gall.

The figure.

The compoſure. The veſſels.

The compoſition of the liver is of veins, nerves, arteries, the coat and proper ſubſtance thereof which we call the groſs and concrete blood, or *Parenchima*. Veins and arteries come to it from the navill; but nerves immediately from theſe which are diffuſed over the ſtomach according to *Hippocrates*; yet they penetrate not very deep into its ſubſtance, for it ſeems not to ſtand in need of ſuch exact ſenſe, but they are diſtributed upon the coat and ſurface thereof, becauſe this part made for diſtribution over the whole body, keeps to it ſelf no acrid or malign humor; for the perception of which it ſhould need a nerve, although the coat inveſting it, ſends many nervous fibers into its ſubſtance, as is apparent by the taking away of the coat from a boiled liver; we muſt think the ſame of the other entrails. The coat of the liver is from the *Peritonæum*, waxing ſmall from the umbilicall vein, when it divides it ſelf for the generation of the gate and hollow veins, as is obſerved by *Galen*, *Lib. de format. Fœtus*. The liver is only one, ſituate in the greater part on the right ſide, but with the leſſer part on the left, quite contrary to the ſtomach. Its chief connexion is with the ſtomach and guts, by the veins and membranes of the *Peritonæum*; by the hollow vein and artery, with the heart; by the nerve with the brain, and by the ſame ligatures with all the parts of the whole body. It is of a hot and moiſt temper, and ſuch as have it more hot, have large veins and hot blood; but ſuch as have it cold, have ſmall veins, and a diſcoloured hew.

The number and ſite. The connexion.

The temper.

ſhew. The action of the Liver is the convertion of *Chylus* into the blood, the work of the ſecond concoction. For although the *Chylus* entring into the meſeraick veins, receive ſome reſemblance of blood, yet it acquires not the form and perfection of blood, before it be elaborate, and fully concoct in the liver. It is bound and tyed with three ſtrong ligaments, two on the ſides in the midſt of the baſtard ribs, to bear up its ſides, and the third more high and ſtrong, deſcending from the breaſt-blade, to ſuſtain its proper part, which with its weight would preſs the lower orifice of the ſtomach, and ſo cauſe a falling or drawing down of the ſternon and coller bone. And thus much may ſuffice for its proper ligaments, for we before mentioned its common; the veins, arteries, nerves, and coat of the *Peritoneum*, by which it is knit to the loins and other naturall parts. But we muſt note, that beſides theſe three proper ligaments, the liver is alſo bound with others to the baſtard ribs; as *Sylvius* obſerves in his Anatomicall obſervations, and *Hollerius* in his Practiſe, *Cap. de pluritide*.

The action.

The ligaments.

CHAP. XIX.

Of the bladder of the Gall.

NOw we muſt come to the bladder of the Gall, which is of a nervous ſubſtance, and of the bigneſs of a ſmall pear; it is of figure round, with the bottom more large, but the ſides and mouth more narrow and ſtrait. It is compoſed of a double coat, one proper, conſiſting of three ſorts of fibers, the other from the *peritoneum*. It hath a vein from the *Porta* or gate-vein, and an artery from that which is diffuſed into the liver, and a nerve from the ſixt conjugation. It is but one and that hid on the right ſide under the greater lobe of the liver, it is knit with the touching of its own body, and of the paſſages and channels made for the performance of its actions with the liver, and in like manner with the *Duodenum*, and not ſeldome with the ſtomach alſo, by another paſſage; and to conclude to all the parts by its veins, nerves, arteries, and common coat. It is of a cold temper, as every nervous part is. The action of it is to ſeparate from the liver the cholerick humor, and that excrementitious, but yet naturall by the help of the right fibers, for the purifying of the blood, and by the oblique fibers, ſo long to keep it being drawn, untill it begin to become troubleſome in quantity, or quality, or its whole ſubſtance, and then by the tranſverſe fibers, to put it down into the *Duodenum* to provoke the expulſive faculty of the guts. I know *Fallopius* denies the texture of ſo many fibers, to be the miniſter of ſuch action to the gall. But *Veſalius* ſeems ſufficiently to have anſwered him. The bladder of the gall hath divers channells, for coming with a narrow neck, even to the beginning of the Gate-vein, it is divided into two paſſages, the one whereof ſuffering no diviſion is carryed into the *Duodenum*, unleſs that in ſome it ſend another branch into the bottome of the ſtomach, as is obſerved by *Galen*; which men have a miſerable and wretched life, being ſubject to cholerick vomitings, eſpecially when their ſtomachs are empty, with great pains of their ſtomach and head, as is alſo obſerved by *Galen*, *Cap.* 74. *Artis Med.* The other coming out of the body of the liver divides it ſelf into two or three paſſages, again entring the ſubſtance of the liver, is divided with infinite branches, accompanying ſo many branches of the Gate-vein through the ſubſtance of the liver, that ſo the blood unleſs it be moſt elaborate and pure, may not riſe into the hollow vein, all which things Diſſection doth manifeſtly teach.

The ſubſtance, greatneſs, and figure thereof. The compoſition, Number and connexion.

Temper. Action.

The channells of the gall.

Lib. 2. de temper.

The ſixth Figure of the bladder of the Gall.

M. the *Pylorus* joyned to the *Duodenum*.
N. the *Duodenum* joyned to the *Pylorus*.
P. ſhews the bottom of the bladder of the gall.
Q Q. the holes of the bladder of gall diſperſed through the liver, betwixt the roots of the hollow and Gate-veins. R. the root of the Gate vein in the liver. S. the root of the hollow vein in the liver. *a.* the concourſe or meeting of the paſſages of choler into one branch. *b.* the neck of the bladder into which the paſſage is inſerted. *c.* the paſſage of the Gall into the *Duodenum*. *d.* the *Duodenum* opened, to manifeſt the inſertion of the *porus biliaris*. *e.* an artery going to the hollow part of the liver, and the bladder of the gall. *f.* a ſmall nerve belonging to the liver and the bladder of gall, from the rib branch of the ſixth pair. *gg.* the ciſtick twins from the gate-veins.

CHAP. XX.

Of the Spleen or Milt.

The substance,

BUt because we cannot well shew the distribution of the gate-vein, unless the Spleen be first taken away, and removed from its seat: therefore before we go any further, I have thought good to treat of the Spleen. Therefore the Spleen is of a soft, rare, and spongious substance (whereby it might more easily receive and drink up the dregs of the blood from the liver) and of a flesh more black than the liver. For it

Magnitude. Figure.

resembles the colour of its muddy blood, from which it is generated. It is of an indifferent greatness; but bigger in some, than in othersome, according to the diverse temper and complexion of men. It hath as it were a triangular figure, gibbous on that part, it sticks to the ribs and midriffe, but hollow on that part next the stomach. It is composed of a coat, the proper flesh; a vein, artery, and nerve. The membrane comes from the *Peritonæum*, the proper flesh from the *fæces* or dregs of bloud, or rather of the naturall melancholy humour, with which it is nourished. The fourth branch of the *vena porta*, or gate vein, lends it a vein; the first branch of the great descendent artery presently, after the first entrance without the Midriff, lends it an artery. But it receives a nerve, from the left costall, from the sixt conjugation on the inner part, by the roots of the ribs; and we may manifestly see this nerve, not only dispersing it self through the coat of the liver, but also penetrating with its vessels the proper flesh thereof, after the self same manner, as we see it is in the heart and lungs. It is one in number, situate on the left side, between the stomach and the bastard ribs, or rather the midriffe which descends to their roots. For it oft times cleaves to the midriffe, on its gibbous part, by a coat from the *Peritonæum*, as also on the hollow part to the stomach, both by certain veins which sends it into the ventricle, as also by the kall. It hath connexion, either primarily, or secundarily, with all the parts of the body, by these its vessels.

Composition.

Number and Site.

Connexion.

Temper and use.

It is of a cold and drie temper; the action and use of it is to separate the melancholick humor, which being feculent and drossie, may be attenuated by the force of many arteries dispersed through its substance. For by their continuall motion, and native heat, which they carry in full force with them from the heart, that gross blood puts off its grosness, which the Spleen sends away by passages fit for that purpose, retaining the subtler portion for its nourishment. The passages by which it purges it self from the grosnesse of the melancholy bloud, are a vein ascending from it into the stomach to stir up the appetite by its sourenesse, and strengthen the substance thereof by its astriction; and also another vein, which sometimes from the Spleen branch, sometimes from the Gate-vein, plainly under its orifice, descends to the fundament, there to make the Hæmorrhoidall veins.

CHAP. XXI.

Of the Vena Porta, *and Gate-vein, and the distribution thereof.*

The substance and figure. Composition. Number and Site.

THe gate-vein, as also all the other veins, is of a spermatick substance, of a manifest largeness, of a round and hollow figure, like to a pipe or quill. It is composed of its proper coat, and one common from the *Peritonæum*. It is only one, and that situate in the simous or hollow part of the liver, from whence it breaks forth (or rather out of the umbilicall vein) into the midst of all the guts, with which it hath connexion, as also with the stomach, spleen, *sphincter* of the fundament and *Peritonæum*, by the coat which it receives from thence. It is of a cold and dry temper. The Action of it is, to suck the *Chylus* out of the ventricle and guts, and so to take and carry it to the Liver, untill it may carry back the same turned into blood for the nutriment of the stomach, spleen and guts. This gate-vein coming out of the simous part of the Liver, is divided into six branches, that is, four simple, and two compound, again divided into many other branches. The first of the simple ascends from the forepart of the trunk to the bladder of the Gall by the passage of the Choler (and are marked with *g. g.*) with a like artery for life and nourishment, and this distribution is knowne by the name of *Cystica gemella* or Cystick twins. The second is called the *Gastrica* or stomach vein, arising in like manner from the forepart of the trunk, is carried to the *Pylorus* and the simous or back part of the stomach next to it.

Temper and Action.

Division thereof into 6 branches, of which, 4 simple.

1 *Cystica gemella*

2 *Gastrica.*

The third is called *Gastrepiploïs*, the stomach and kall vein, which coming from the right side of the gate-vein goes to the gibbous part of the stomach next to the *Pylorus* and the right side of the kall.

3 *Gastrepiploïs.*

The fourth going forth from behind and on the right hand of the gate-vein, ascends above the root of the Meseraick branch even to the beginning of the gut *Jejunum*, along the gut *Duodenum*, from whence it is called *Intestinalis*, or the gut vein. And these

4 *Intestinalis.*

are

are the foure ſimple branches. Now we will ſpeak of the compound.

To compound.

The firſt is the ſplenick, which is divided after the following manner. For in its firſt beginning and upper part, it ſends forth the *Coronalis*, or crowne vein of the ſtomach, which by the back part of the ſtomach aſcends into the upper and hollow part thereof; to which place, as ſoon as it arrives, it is divided again into two branches, the one whereof climbs up even to its higher orifice, the other deſcends downe to the lower, ſending forth by the way other branches to the fore and back parts of the ſtomach. Theſe engirt and on every ſide incompaſs the body of the ventricle, for which cauſe they are named the crown veins.

1 *Ramus* ſplenicus ſending forth.

1 *Coronalis.*

I have ſometime obſerved this comming forth of the trunk, a little above the orifice of the ſplenick branch. But this ſame ſplenick branch on its lower part, produces the branch of the Hæmorrhoidall veins, which deſcending to the fundament above the left ſide of the loines, diffuſes a good portion thereof into the leaſt part of the colick gut, and the right gut, at the end whereof it is often ſeen to be divided into five Hæmorrhoidall veins, ſometimes more, ſometimes leſs.

2 *Hæmorrhoidalis interna.*

Silvius writes that the Hæmorrhoidall branch deſcends from the meſenterick, and truly we have ſometimes obſerved it to have been ſo. Yet it is more ſutable to reaſon, that it ſhould deſcend from the ſplenick, not only for that we have ſeen with our eyes that it is ſo, but alſo becauſe it is appointed by nature for the evacuation of the excrementitious melancholick humor. But this ſame ſplenick branch out of the middle almoſt of its upper part produces the third branch going to the gibbous part of the ſtomach, and the kall; they terme it the greater, middle and left *Gaſtrepiploa*. But on the lower part towards the ſpleen it produces the ſimple *Epiploïs*, or kall-vein, which it diffuſes through the left ſide of the kall. Moreover from its upper part, which touches the liver, it ſends forth a ſhort branch called *vas breve*, or *venoſum*, to the upper orifice of the ventricle for ſtirring up the appetite.

3 *Gaſtrepiploïs major ſiniſtra.*

4 *Epiploïs ſimplex.*

5 *Vas breve ſeu venoſum.*

We have oftentimes and almoſt alwayes obſerved, that this venie veſſell, which *Galen* cals *vas breve*, comes from the very body of the ſpleen, and is terminated in the midſt of the ſtomach on the left ſide, but never pierces both the coats thereof. Wherefore it is ſomewhat difficult to find, how the melancholy juyce can that way be powred, or ſent into the capacitie of the ſtomach. Now the ſplenick branch, when it hath produced out of it thoſe five forementioned branches, is waſted and diſperſed into the ſubſtance and body of the ſpleen.

Lib. 4. de uſu partium.

Then followes another compound branch of the *vena porta*, called the meſenterick, which is divided into three parts; the firſt and leaſt whereof goes to the blind gut and to the right and middle part of the colick-gut, divided into an infinite multitude of other branches. The ſecond and middle is waſted in the *Ileon*; as the third and greater in the *Iejunum* or empty gut. It is called Meſenterick becauſe it is diffuſed over all the Meſentery; as the ſplenick is in the ſpleen. And thus much we have to ſay of the diviſion of the gate vein, the which if at any time thou ſhalt find to be otherwiſe, than I have ſet downe, you muſt not wonder at it; for you ſhall ſcarce find it the ſame in two bodies, by reaſon of the infinite varietie of particular bodies, which (as the Philoſophers ſay) have each their owne, or peculiar gifts. Our judgment is the ſame of other diviſions of the veſſels. Yet we have ſet down that which we have moſt frequently obſerved.

2 *Ramus meſentericus* devided into three parts.

CHAP. XXII.

Of the originall of the Artery, and the diviſion of the branch, deſcending to the naturall parts.

THoſe things being thus finiſhed and conſidered, the guts ſhould be pulled away, but ſeeing that if we ſhould do ſo, we ſhould diſturb and loſe the diviſion of the artery deſcending to the naturall parts; therefore I have thought it better to handle the diviſion thereof, before the guts be pluckt away. Therefore we muſt ſuppoſe, according to *Galens* opinion, that as all the veins come from the liver, ſo all arteries proceed from the heart. This preſently at the beginning is divided into two branches, the greater whereof deſcends downwards to the naturall parts upon the ſpine of the back, taking its beginning at the fifth *vertebra* thereof, from whence it goes into the following arteries. The firſt called the intercoſtall, runs amongſt the intercoſtall muſcles, and the diſtances of the ribs, and ſpinall marrow, through the perforations of the nerves on the right and left hand from the fifth true, even to the laſt of the baſtard ribs.

The originall of arteries. The diviſion of the great deſcendent artery, is into theſe.

1 *Arteria intercoſtalis.*

This in going this progreſs makes 7. little branchings, diſtributed after the forementioned manner, and going forth of the trunk of the deſcendent over againſt each of the intercoſtall Muſcles.

The ſecond being parted into two goes on each ſide to the Midriffe, whence it may be called, or expreſſed by the name of the *Diaphragmatica* or *Phrenica*, (*i*) the midriffe artery. The third being of a large proportion, ariſing from the upper part of the arterie preſently after it hath paſſed the midriffe, is divided into two notable branches, whereof on goes to the ſtomach, ſpleen, kall, to the hollow part of the liver and the gall; the other is ſent forth to the meſen-

2 *Phrenicæ*

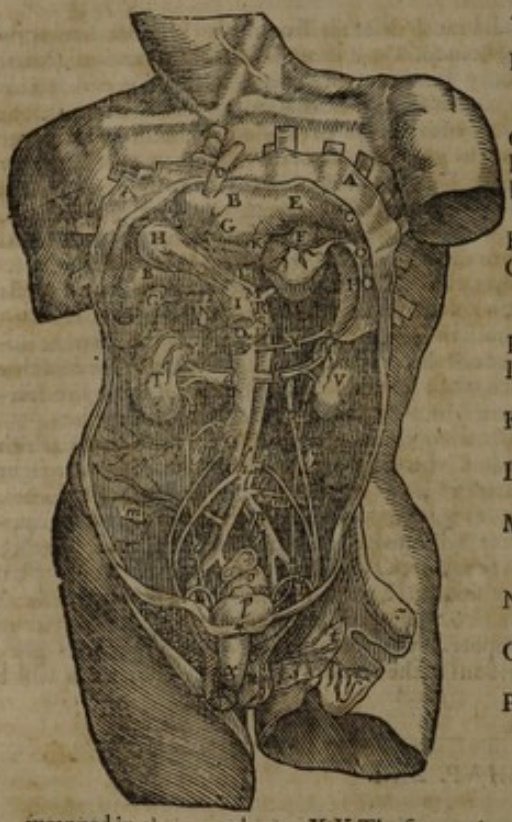
3 *Cœliaca.*

meſentery and guts after the ſame manner, as we ſaid of the meſeraick veins, wherefore it is called the *Cœliaca*, or ſtomach artery. But we muſt note, all their mouths penetrate even to the innermoſt coat of the guts, that by that means they may the better and more eaſily attract the *Chylus* contained in them.

4. *Emulgent.* The fourth is carryed to the reins, where it is named the Reinall or Emulgent, becauſe it ſucks fit matter from the whole maſs of blood.

5. *Spermatica.* The fifth is ſent to the teſticles with the preparing Spermatick veins, whence alſo it is named the Spermatick Artery, which ariſes on the right ſide, from the very trunk of the deſcendent Artery; that it may aſſociate the ſpermatick vein of the ſame ſide, they run one above another, beneath the hollow vein, wherefore we muſt have a great care whilſt we labour to lay it open, that we do not hurt and break it.

The ſeventh figure of the lower Belly.



A, A, The midriffe turned back with the ribs and the *peritonæum*.
BB, The cave or hollow part of the liver, for the liver is lifted up that the hollow part of it may be better ſeen.
C, The leaſt ligament of the liver.
D, The Umbilicall vein.
E, The hollowneſs in the liver, which giveth way to the ſtomach.
F, The left orifice of the ſtomach.
G G, Certain knubs, or knots, and impreſſions in the hollow part of the liver.
H, The bladder of gall.
I, The Gate-vein, cut off, and branches which go to the bladder of gall.
K, A nerve of the liver coming from the ſtomachicall nerve.
L, An Artery common to the liver and bladder of gall.
M, A Nerve common alſo to them both, coming from the right *coſtall* Nerve of the ribs.
N, the paſſage of the Gall to the Guts cut off.
O O, The hollow of the fore parts of the Spleen.
P, The line where the veſſels of the Spleen are implanted. Q. The trunk of the hollow vein. R, The trunk of the great Artery. S, The *Cœliacall* Artery cut off. T, V, The Kidneys yet wrapped in their membrane. X, Y, The fatty veins called *venæ adiposæ*. *a*, *b*, The Emulgent veins with the Arteries under them. *c c*, *d d*, The Ureter from either kidney to the bladder. *e*, *f*, The ſpermaticall veins to the teſticles, the right from the hollow vein, the left from the Emulgent. *g*, *g*, Veins coming from the ſpermaticall to the *peritonæum*. *h*, *i*, the ſpermaticall Arteries. *k*, The lower meſentericall Artery. *l*, The aſcending of the great Artery above the hollow vein, and the diviſion of it, and the hollow vein into two trunks. *m*, the Arteries of the loins called *lumbaris*. *n*, The holy Artery called *Sacra*. *o*, A part of the right gut. *p*, The bladder of Urine. * The connexion of the bladder with the *peritonæum*. *q*, A part of the veſſels which lead the ſeed from the Teſticles, is here reflected. *r*, *ſ*, the *ſcrotum*, or cod, that is, the skin that inveſts the yard and teſticles. *t*, The fleſhy pannicle or membrane which is under the cod. *u*, The coat which is proper to the teſticles with his veſſels. *x*, A part of the yard excoriated or flayed, and hanging down.

Hæmorrhoidalis ſeu meſenterica inferior. The ſixth going from the fore and upper part of this deſcendent arterie, deſcends with the Hæmorrhoidall veins to the fundament; preſently from his beginning, ſending forth certain branches alongſt the colick gut, which by *Anaſtomaſis* are united with other branches of the *Cœliacall* Arteries; for whoſoever ſhall look more attentively, he ſhall often obſerve that veins are ſo united amongſt themſelves, and alſo Arteries, and ſometimes alſo the veins with the Arteries. For an *anaſtomaſis* is a communion and communicating of the veſſels amongſt themſelves, by the application of their mouths, that ſo by mutuall ſupplies they may eaſe each others defects. But they call this the lower meſeraick Artery.

7. *Lumbaris.* The ſeventh proceeding from the trunk with ſo many branches as there be *Vertebra's*

in

in the loines,goes to the loines and the parts belonging to them, that is, the ſpinall marrow of that part,and other parts encompaſſing theſe *Vertebra's*, whereupon it is ſtiled the *Lumbaris* or Loine Artery.

Iliaca.

The eight maketh the Iliack arteries, untill ſuch time as it departs from the *Peritonæum* where the Crurall Arteries take their originall. This Iliack Artery ſends many divarications towards the Holy bone where it takes its beginning,and to the places lying neer the Holy bone,which becauſe they run the ſame courſe as the Iliak veins, for brevities ſake, we will let paſs further mention of them,till we come to treat of the Iliack veins.

CHAP. XXIII.

Of the diſtribution of the Nerves to the naturall parts.

The originall of the nerves which are carryed to the naturall parts.

IT remains,that before the bowels be taken away, we ſhew the nerves ſent to the entrails and natural parts,that as wiſe and provident men we may ſeem to have omitted nothing.Firſt we muſt know that theſe nerves are of the ſixt conjugation,which deſcend as well to the ſtomach all alongſt the Gullet and the ſides thereof,as thoſe at the roots of the ribs on both ſides within. But when they are paſſed through the Midriffe,thoſe which are diſtributed amongſt the naturall parts follow the turnings of the veins and arteries, but ſpecially of the arteries. Wherefore if you have a mind to follow this diſtribution of the nerves, you muſt chiefly look for it in thoſe places, in which the artery is diſtributed amongſt the Guts above the loins.

Their magnitude and uſe.

Theſe nerves are but ſmall, becauſe the parts ſerving for nutrition, needed none but little nerves,for the performance of the third duty of the nerves,which is in the diſcerning & knowing of what is troubleſome to them. For unleſſe they had this ſenſe, there is nothing would hinder, but theſe bowels neceſſary for life,being poſſeſſed with ſome hurtfull thing, the creature ſhould preſently fall down dead; but we have this benefit by this ſenſe, that as ſoon as any thing troubles and vellicates the bowels, we being admoniſhed thereof may look for help in time.

And beſides if they were deſtitute of this ſenſe,they might be gnawn, ulcerated and putrefied by the raging acrimony of the excrements falling into and ſtaying in them;but now (by means hereof) as ſoon as they find themſelves pricked, or pluckt,preſently by the expulſive faculty they endeavour to expell that which is troubleſome, and ſo free themſelves of preſent and future dangers.

CHAP. XXIIII.

The manner of taking out the Guts.

WHen the Guts are to be taken out,you muſt begin with the right Gut. And you muſt divide it,being firſt ſtraitly tyed in two different places, at a juſt diſtance about four fingers from the end, with a ſharp knife between the two ligatures. Then you muſt ſhew its proper coats,and fibers,and that common one which it hath from the *Peritonæum*. This being done, you muſt in like manner bind the trunk of the gate veine as neer the originall as you can;that ſo all his branches being in like manner tyed there may be no feare of effuſion of blood:you muſt doe the like with the Cœliack Artery at the left Kidney,and in the lower Meſenterick, which deſcends to the right Gut with the Hæmorrhoidall veins.This being done, pull away the guts even to the *Duodenum*, which being in like manner tyed in two places, which ought to be below the inſertion of the *Porus Cholagogus* or paſſage of the Gall,that you may ſhew the oblique inſertion thereof into that gut,for the obliquity of its inſertion is worth obſervation, as that which is the cauſe that the Gall cannot flow back into its bladder, by the compreſſion of this Gut from below upwards.Then all theſe windings of the Guts may be taken away from the body.

CHAP. XXV.

The Originall and diſtribution of the deſcendent Hollow veine.

The originall of the hollow veine.

It is divided into two trunks.

BEcauſe the reſt of the naturall parts, do almoſt all depend upon the deſcendent Hollow vein,therefore before we goe any further,we will ſhew its originall and diſtribution.We ſaid before that all veins proceeded from the Liver, but yet in divers places.For the gate vein goes out of the hollow part, and the hollow vein out of the Gibbous part of the liver, which going forth like the body of a tree,is divided into two great branches,the leſſer of which goes to the vital & animal parts,

and the extremeties of these parts, as we shall shew in their place. The greater descending from the back part of the Liver above the *Vertebra's* of the loins to the parts beneath, goes in the manner following. The first division thereof is to the membranes of the reins, which come from the *Peritoneum*. Wherefore there it produces the *Vena adiposa*, or fatty veins, so called, because they bring forth a great quantity of fat in those places; Of these fatty veins, there is a diverse originall, for the right doth oftentimes arise from the right emulgent, because it is higher; but the less comes from the very trunck of the hollow vein because the Emulgent on that side is lower, and you shall scarse see it happen otherwise.

The division of the greater branch of the hollow vein.

1. *Adiposa.*

The second being the Kidney or Emulgent veins, go to the Reins, which at their entrance, or a little before, is divided into two branches, like as the Artery is, the one higher, the other lower, and these again into many other through the substance of the Kidneys, as you may learn better by ocular inspection, than by book. They are thick and broad, that the serous humor may without impediment have freer passage. Their originall is different, for the right Emulgent oftentimes comes forth of the hollow vein somewhat higher than the left; that seeing their office and duty is to purge the mass of blood from the cholerick and serous humor, that if any part thereof slide by the one, it may not so scape, but fall as it were into the other. Which certainly would not have happened if they had been placed, the one just opposite to the other. For the serous or wheyish humor would have stayed as equally ballanced or poised, by reason of the contrariety of the action and traction, or drawing thereof. But we must remember that in dissecting of bodies, I have oft-times found in such as have been troubled with the stone, seven Emulgent veins and so many arteries; four from the left side coming from divers places, of which the last came from the Iliack; three from the right hand likewise in divers places.

2. *Emulgent.*

The third division is called the Spermatick or seed vein, it goes to the Testicles; the originall thereof is thus, that the right arises on the forepart of the trunck of the hollow vein; but the left most commonly from the Emulgent. Besides you shall sometimes find that these have companions with them, to the right Emulgent; but to the left, another from the hollow vein, in some but on one side, in others on both. But also I have sometimes observed the left emulgent to proceed from the spermatick or seed vein.

3. *Spermatica.*

The fourth because it goes to the loins is called *Lumbaris*; which in his originall and insertion is wholly like the Artery of the loins. But there are 4 *Lumbares* or Loin-veins on each side, that is, one in each of the 4 spaces of the 5 *Vertebra's* of the loins.

4. *Lumbaris.*

The fift division makes the *Iliaca*, untill passing through the *Peritoneum*, they take the names of Crurall veins; These are first divided into the musculous, so called, because they goe to the oblique ascendent and transverse muscles, and to the *Peritoneum*. Sometimes they have their originall from the end of the Trunk. And then the same *Iliaca*, are divided into the *Sacra*, or Holy; which goe to the spinall marrow of the Holy-bone, through those holes, by which the nerves generated of this marrow, have their passage.

5. Iliacæ which are divided into.

1. Musculosæ.

2. Sacræ.

Thirdly, the *Iliaca* are divided into the *Hypogastrica*, so called, because they were distributed to all the parts of the *Hypogastrium*, or lower part of the lower belly, as to the right Gut, the muscles thereof, the musculous skin, (in which place they often make the externall Hæmorrhoidall, ordained for the purging of such blood as offends in quantity, as those other, [that is, the inward Hæmorrhoidall] which descends to the right Gut from the Gate-vein by the spleenick branch, serves for cleansing of that which offends in quality,) to the bladder and the neck thereof, even to the end of the yard, to the womb and even to the neck of the wombe and utmost parts of the privities, from whence it is likely the courses break forth in women with child and Virgins. But this same vein also sends a portion also without the *Epigastrium* by that perforation which is common to the share and haunch bones, which strengthened by meeting of the other internall Crurall vein descends even to the Ham, but in the mean time by the way it is communicated to the muscles of the thigh called *Obturatores* and other parts within. Fourthly, the *Iliaca* produce the *Epigastrica* which on both sides from below ascend according to the length of the right muscles, spreading also by the way some branches to the oblique and transverse muscles and also to the *Peritoneum*. Fiftly, these produce *Iliacæ* the *Pudendæ* or veins of the privities, because they go in women to their privities, and into men to the Cods, where they enter that fleshy coat filled with veins, and go to the skin of the yard, they take their beginning under the *Hypogastrica*.

3. *Hypogastricæ*, which produce the Hæmorrhoidales externæ.

4. *Epigastricæ.*

5. *Pudendæ.*

CHAP.

CHAP. XXVI.

Of the Kidneys or Reins.

NOw follow the Kidneys, which that they may be more easily seen, (after that you have diligently observed their situation) you shall dispoil of their fat, if they have any about them, as also of the membrane they have from the *Peritonæum*. First, you shall shew all their conditions, beginning at their substance.

Their substance. Magnitude. Figure.

The substance of the Kidneys is fleshy, dense and solid, lest they should be hurt by the sharpness of the urine. Their magnitude is large enough, as you may see. Their figure is somewhat long and round almost resembling a semicircle, and they are lightly flatted above and below. They are partly hollow and partly gibbous; the hollow lies next the hollow vein, and on this side they receive the Emulgent veins and Arteries, and send forth the Ureters, their gibbous part lies towards the loins.

Composition.

They are composed of a coat coming from the *Peritonæum*, their own peculiar flesh, with the effusion of blood about the proper vessels, (as happens also in other entrails) generates a small nerve, which springing from the Costall of the sixt conjugation is diffused to each Kidney on his side into the coat of the kidney it self, although others think it alwayes accompanies the vein and artery.

The ninth and tenth figure of the vessels of seed and urine.

FIG. XI.

FIG.

The first figure sheweth the foreside, the second the hinder-side.

a.a.a. 1. The forepart of the right kidney.

b. b. b. 2. The back part of the left kidney.

c. 1. the outside.

d. d. 1, 2. The inner-side.

e. e. 1, 2. The two cavities whereinto the emulgent vessels are inserted.

f. f. 1, 2. The trunk of the hollow vein.

g. g. 1, 2. The trunk of the great artery.

h. i. 1, 2. The emulgent vein and artery.

k. k. 1, 2. The right fatty vein.

l. 1. The left fatty vein.

*. 1. The Cœliacall artery.

m. n. 1, 2. The ureters.

o. p. q. 1, 2. The right spermatick veine which ariseth neer *p.* the left neer *q.*

r. i. The place where the Arteries of the seed arise.

ſ. 1, 2. Small branches distributed from the spermaticall veins to the *Peritonæum*. *t.* 1, 2. The spiry varicous body, called *Varicosum Vas pyrimidale*. *u.* 1, 2. The *Parastatæ*, or *Epididymis*. *x.* 1. The testicle yet covered with its coat. *y.* 1, 2. The place where the leading vessell called *vas deferens*, doth arise. *α*, 1, 2. The descent of the same leading vessell. *β*, 1, 2. The revolution of the same leading vessell. *γ*, 1, 2. The passage of the same vessell, reflected like a recurrent nerve. *δ* 2. The meeting of the same leading vessels. *ε*, 1, 2. The bladder of urine, the first figure sheweth it open, the second sheweth the back parts. *ζζ*, 1. The small bladder of the seed opened. *ηη*, 2. The Glandules called *Glandulæ Prostatæ*. *θ*, 1. The Sphincter muscle of the bladder. *ικ*, 1, 2. The two bodies which make the substance of the yard. *λ, λ*, 1. The vessels which go unto the yard and neck of the bladder. *μ*, 1. The passage which is common to the urine and seed, cut open. *Ψ*, 2. The implantation of the ureters into the bladder.

But *Fallopius* that most diligent Author of Anatomy hath observed, that this nerve is not only oftentimes divaricated into the coat of the kidneys, but also pierces into their substance.

Number. Site. Connexion. Temper, Action. Their strainer.

stance. They are two in number, that if the one of them should by chance be hurt, the other might supply those necessities of nature, for which the Kidneys are made. They lye upon the loyns at the sides of the great vessels, on which they depend by their proper veins and arteries; and they stick to them, as it were by a certain second coat, lest that they might be shaken by any violent motions. Wherefore we may say that the Kidneys have two coats, one proper adhering to their substance, the other as it were coming from the *Peritonæum* on that part they stick to it. The right Kidney is almost alwayes the higher, for those reasons I gave, speaking of the originall of the Emulgent vessels. *Columbus* seems to thinke the contrary, but such like controversies may be quickly decided by the Eye. They have connexion with the Principall vessels by the veins, nerves and arteries, by the coats with the loins & the other parts of the lower belly, but especally with the bladder by the ureters. They are of a hot and moist temper, as all fleshy parts are. Their action is to cleanse the Masse of the blood from the greater part of the serous and cholerick humor. I said the greater part, because it is needfull that some portion thereof should go with the alimentary blood to the solid parts, to serve in stead of a vehicle, lest otherwise it should be too thick.

Besides you must note that in each Kidney there is a cavity bounded by a certain membrane, incompassed by the division of the Emulgent veins and arteries, through which the urine is strained partly by the expulsive faculty of the Kidneys, partly by the attractive of the ureters, which run through the substance of the Kidneys on the hollow side, no otherwise than the *Porus cholegogus* through the body of the Liver.

CHAP. XXVII.

Of the spermatick Vessels.

NOw we should have spoken of the ureters, because as we said before, they are passages derived from the Kidneys to carry the urine to the bladder. But because they cannot be distinguished and shewed unlesse by the corrupting and vitiating the site of the spermatick vessels; therefore I have thought it better to pass to the explication of all the spermatick parts.

And first of all you must gently separate them, (that so the declaration of them may be more easie and manifest) and that from the coat which comes from the *peritonæum*, and the fat which invests them even to the share-bone, having diligently considered their site before you separate them. Then you shall teach that the substance of these vessels, is like to that of the veins and arteries. Their quantity is small in thicknes, but of an indifferent length by reason of the distance of their originall from the Testicles. They are longer in men than in women, because these have their Testicles hanging without their belly, but women have them lying hid within their belly. Their figure and composure is wholly like the figure and composition of the veines and arteries, except in this one thing, that from that place where they goe forth of the great capacity of the *Peritonæum*, they are turned into many intricate windings, like crooked swoln veins, even to the Testicles. That the spermatick matter in that one tract, which yet is no other than blood, may be prepared to concoction, or rather be turned into seed in these vessels, by the irradiation of the faculty of the Testicles. These vessels are six in number, foure preparing, and two ejaculatory, of which we will speak hereafter. Therefore on each side there be two preparing vessels, that is, a vein and an artery, arising as we told you when we spoke of the distribution of the hallow vein. They are inserted into the Testicles through that coate which some call *Epididymis*, others *Darton*. Their site is oblique above the loins & flanks, whilest they run downe between the ends of the share and haunch bone, they are knit to the parts lying under them, both by certaine fibers which they send from them, as also by the membrane they have from the *Peritonæum*. They have like temperature as the veines and Arteries have. Their action is to carry blood to the Testicles, for generating of seed.

Their substance. Quantity. Figure and composure. Number. Site.

CHAP. XXVIII.

Of the Testicles, or Stones.

THe Testicles are of a Glandulous, white, soft and loose substance, that so they may the more easily receive the spermatick matter: their magnitude and figure equall, and resemble a small pullets Egge somewhat flatted; their composure is of veins, arteries, coats and their proper flesh. Their veins and arteries proceed from the spermatick vessels, their nerves from the sixt conjugation, by the roots of the ribs and out of the holy bone. They are wrapped in foure coats, two whereof are common, and two proper. The common are the *Scrotum* or skin of the Cods, proceeding from the true skin; and the fleshy coat, which consists of the fleshy Pannicle in that place receiving a great number of vessels, through which occasion it is so called. The proper coats are first the *Erythroïs* arising from the process of the *Peritonæum*, going into the *Scrotum* together

Their substance. Magnitude and figure. Composition. The coat *Erythroïs*

gether with the ſpermatick veſſels which it involves and covers; this appears red both by reaſon of the veſſels as alſo of the Cremaſter muſcles of the Teſticles; Then the *Epididymis* or *Dartos* which takes its originall of the membrane of the ſpermatick preparing veſſels. The fleſh of the Teſticles is as it were a certaine effuſion of matter about the veſſels, as we ſaid of other entrails. But you muſt obſerve that the *Erythroïs* encompaſſes the whole ſtone, except its head, in which place it ſticks to the *Epididymis*, which is continued through the whole ſubſtance of the Teſticle. This *Epididymis* or *Dartos* was therefore put about the ſtones, becauſe the Teſticles of themſelves, are looſe, ſpongious, cavernous and ſoft, ſo that they cannot ſafely be joined to the ſpermatick veſſels, which are hard and ſtrong. Wherefore Nature that it might join extreams by a fit *Medium* or mean, formed this coat *Epididymis*. This is ſcarce apparent in women by reaſon of its ſmalneſſe. The two forementioned common coats, adhere or ſtick together by their veſſels not only amongſt themſelves, but alſo with the *Erythroïs*. You muſt beſides obſerve the Cremaſter muſcles are of the ſaid ſubſtance with other muſcles, ſmall and thin, of an oblique and broad figure, ariſing from the membrane of the *Peritonæum*, which (as we ſaid before) aſſumes fleſh from the flanks. Their compoſition is like that of other muſcles. They are two, on each ſide one. They are ſituate from the ends of the flanks, even to the ſtones. They have connexion with the proceſs of the *Peritonæum* and Teſticles. Their temper is like that of other muſcles. Their action is to hang and draw up the Teſticles towards the belly, whence they are called hanging muſcles. The Teſticles are moſt commonly two in number, on each ſide one; ſometimes there be three, ſometimes one alone, as it happens alſo in the Kidnies; for ſome have but one Kidney. They lie hid in the *Scrotum* at the very roots of the ſharebone, connexed to the principall parts of their veſſels, with the neck of the bladder and yard; but by their coats they adhere to the parts from whence they have them. They are of a cold and moiſt temper, becauſe they are glandulous; although they may be hot by accident, by reaſon of the multitude of the veſſels flowing thither. Thoſe whoſe teſticles are more hot are prompt to venery, and have their privities and the adjacent parts very hairy, and beſides their teſticles are very large and compact. Thoſe on the contrary that have them cold are ſlow to venery, neither do they beget many children, and thoſe they get are rather female than male, their privities have little hair upon them, and their teſticles are ſmall, ſoft and flat.

The *Epididymis*, or *Dartos*.

The Cremaſter muſcles.

Temper.

The action of the teſticles is to generate ſeed, to corroborate all the parts of the body, and by a certain manly irradiation to breed or encreaſe a true maſculine courage. This you may know by Eunuchs or ſuch as are Gelt, who are of a womaniſh nature, and are oftentimes more tender and weak than women. As *Hippocrates* teaches, by example of the *Scythians*, *lib. de Aere, locis & aquis.*

Action.

CHAP. XXIX.

Of the varicous bodies or Paraſtat's, *and of the ejaculatory veſſels, and the glandulous or* Proſtates.

THe varicous *Paraſtatæ* are nervous and white bodies, like as the nerves wound and cloſe woven amongſt themſelves, they are ſtretched even from the top to the bottom of the teſticles, from whence preſently by their departure they produce the *Vaſa ejaculatoria*, or leading veſſels. But unleſs we doe very well diſtinguiſh their names, they ſhall ſcarce ſhun confuſion. For that which I call *Paraſtatæ*; that is, as it were the head of the teſticle, being as it were like another ſtone, is called *Epididymis* by *Galen. lib. 1. de ſemine.* But I by the example and authority of many Anatomiſts, underſtand by the *Epididymis* the proper coat of the teſticles, of which thing I thought good by the way to admoniſh you of. Their Action is by their crooked paſſages to hinder the ſeed from departing out of the preparing into the leading veſſels before it ſhall bee moſt perfectly laboured and concocted in theſe veſſels by the power and force of the teſticles. For in the firſt windings, the blood lookes pure; but in the laſt it is not ſo red, but ſomewhat whitiſh For Nature commonly doth thus delay the matter in its paſſage either by ſtraitneſs, or obliquity, which it deſires to make more perfect and elaborate by any new concoction; this we may learn by the foldings of the *Rete mirabile*, the windings of the Guts, the wrinkles in the bottome of the ſtomach, the ſtraitneſſe of the *Pylorus*, the capillary veins diſperſed through the body of the Liver; certainly nature hath intended ſome ſuch thing in the making of the ſpermatick veſſels. Their quantity is viſible, and figure round, tending ſomewhat to ſharpneſſe. They are compoſed of veins, nerves, and arteries, which they enjoy from the veſſels of the teſticles, from the *Epididymis*, or the coat, from the *Peritonæum* and their proper ſubſtance. Their temper is cold and dry. They bee two in number, one to each teſticle. But theſe varicous bodies are called *Paraſtatæ*, Aſſiſters, becauſe they ſuperficially aſſiſt, and are knit to the teſticles according to their length, or long wayes. Out of the *Paraſtatæ* proceed the *Vaſa ejaculatoria*, or leading veſſels, being of the ſame ſubſtance as their Progenitors; that is, ſolid, white and as it were nervous. Their quantity is indifferent, their figure round, and hollow, that the ſeed may have a free paſſage through them, yet they ſeem not to bee perforated by any manifeſt paſſage, unleſs

Their ſubſtance.

Here the author ſpeaks otherwiſe then *Galen.*

Action.

Their quantity figure, and compoſure.

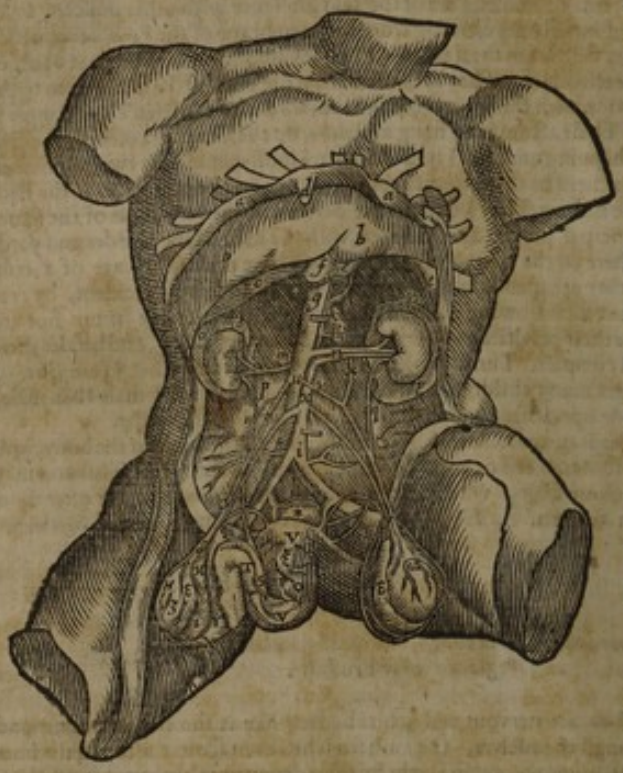
Their temper and number.

Vaſa ejaculatoria, the ejaculatory or leading veſſels.

unleſs by chance in ſuch as have had a long *Gonorrhœa*. They have like temper as the *Paraſtates*, between which and the *Proſtates* they are ſeated, immediately knit with them both; as both in the coat and the other veſſels with the parts from whence they take them.

But we muſt note, that ſuch like veſſels coming out of the *paraſtates* aſcend from the bottom of the ſtones even to the top, in which place meeting with the preparing veſſels, they riſe into the belly by the ſame paſſages, and bind themſelves together by nervous fibers, even to the inner capacity of the belly; from whence turning back, they forſake the preparing, that ſo they may run to the bottom of the ſhare-bone, into the midſt of two glandulous bodies which they call *proſtates* ſituate at the neck of the bladder, that there meeting together they may grow into one paſſage.

The tenth figure, wherein thoſe things ſhewed in the former figure, are more exactly ſet forth.



aa, A part of the Midriffe and of the *Peritonæum* with the ribs broken.
bb, *cc*. The Convex or gibbous part of the Liver marked with *bb*. the hollow or concavous part with *cc*.
d e, The right and left ligaments of the Liver.
f, The trunk of the gate vein.
g, The trunk of the hollow vein.
h, *l*, The fatty veins both left and right.
i, The aſcent of the great artery of above the hollow vein, and the diviſion thereof.
k, The *Celiacall* artery.
m, *n*, The emulgent veſſels.
oo, *ff*, The fat tunicles or coats torn from both the kidneys.
qq, The ureters that go unto the bladder.
r, *u*, The right ſpermaticall vein which ariſeth near to *u*. *x*, *y*, The double originall of the left ſpermaticall vein. *x*. from the emulgent. *y*, from the hollow vein. *α*, The originall of the ſpermaticall arteries. *β*, Certain branches from the ſpermatick arteries which run unto the *Peritonæum*. *γ*, The paſſage of the ſpermaticall veſſels through the productions of the *Peritonæum*, which muſt be obſerved by ſuch as uſe to cut for the Rupture. *δ*, The ſpiry bodden bodies entrance into the teſticle, it is called *Corpus varicoſum pyramidale*. *ε*, The *Paraſtata*. *ζ*, The ſtone or teſticle covered with his innioſt coat. *η*, The deſcent of the leading veſſell called *Vas deferens*. *V y*, The Bladder. * The right gut. *ξ*, The glandules called *proſtatæ* into which the leading veſſels are inſerted. *ρ*, The muſcle of the bladder. *στυ*, Two bodies of the yard, *φ*, and *τ*, and *υ*, his veſſels. *χ*, The coat of the Teſticle. *ψω*, The muſcle of the Teſticle *ϕ*, hit veſſels *ω*.

For thus of three paſſages, that is, of the 2 leading veſſels, and 1 paſſage of the bladder, there is one common, one in men for the caſting forth of ſeed and urine. A Caruncle riſing like a creſt at the beginning of the neck of the bladder argues this uniting of the paſſages, which receiving this ſame paſſage which is ſufficiently large, is oft-times taken by ſuch as are ignorant in Anatomy for an unnaturall Caruncle, then eſpecially when it is ſwoln through any occaſion. Theſe leading veſſels are two in number, on each ſide one. Their action is to convey the ſeed made by the teſticles to the Proſtats, & ſo to the neck of the bladder, ſo to be caſt forth at the common paſſage. But if any ask whether that common paſſage made by the two leading veſſels between the two glandulous bodies be obvious to ſenſe or no: We anſwer, it is not manifeſt, though reaſon compell us to confeſs that that way is perforated by reaſon of the ſpermatick, groſs and viſcous matter carryed that way. But peradventure the reaſon why that paſſage cannot be ſeen is, becauſe in a dead carcaſs all ſmall paſſages are cloſed and hid, the heat and ſpirits being gone, and the great appear much leſs,

Their number and action.

by

by reason all the perforations fede, and fall into themselves. Yet certainly these passages must needs be very strait, even in a living man, seeing that in a dead they will not admit the moint of a needle. Wherefore we need not fear, lest in searching, whilst we thrust the *Catheter* into the bladder, it penetrate into the common passage of the leading vessels which runs within the Caruncle, unless peradventure by some chance, as a *Gonorrhœa*, or some great *Phlegmon*, it be much dilated besides nature. For I have sometimes seen such passages so open, that they would receive the head of a Spathern; which thing should admonish us, that in searching we take great care, that we do not rashly hurt this Caruncle, for being somewhat rashly handled with a *Catheter* it casts forth blood, especially if it be inflamed. But also the concourse of the spirits flowing with great violence together with the seed, much helps forward such ejaculation thereof performed through these strait passages by the power of the imaginative faculty in the Act of generation.

This Caruncle must be observed and distinguished from a *Hypersarcosis* or fleshy excrescence.

After the leading vessels follow the *Prostatæ*, being glandulous bodies of the same substance and temper that other Glandules are. Their quantity is large enough, their figure round, & somewhat long, sending forth on each side a soft production of an indifferent length. They are composed of veins, nerves, arteries, a coat (which they have from the neighbouring parts) and lastly their proper flesh, which they have from their first conformation. They are two in number, situate at the root of the neck of the bladder, somewhat straitly bound or tyed to the same, to the leading vessels, and the parts annexed to them. But alwayes observe, that every part which enjoyes nourishment, life and sense, either first or last hath connexion with the principall parts of the body, by the intercourse of the vessels which they receive from thence.

The Prostatæ. Their quantity and figure.

Number and site.

An anatomicall axiome.

The use of the Prostates is, to receive in their proper body the seed laboured in the testicles, and to contain it there, untill it be troublesome either in quantity or quality, or both. Besides they contain a certain oily and viscid humor in their glandulous body, that continually distilling into the passage of the urine, it may preserve it from the acrimony & sharpness thereof. But we have observed also on each side other Glandules, which *Konsletius* calls *Appendices glandulosæ*, Glandulous dependences to arise from these prostates, in which also there is seed reserved.

Their use.

Read in meth. med. ad morbos.

CHAP. XXX.

Of the Vreters.

NOw it seems fit to speak of the *Vreters*, bladder and parts belonging to the bladder. Therefore the Ureters are of a spermatick, white, dense and solid substance, of an indifferent bignes in length and thicknes. Their figure is round and hollow. They are composed of two coats, one proper, consisting of right and transverse fibers, which comes from the emulgent veins and arteries; the other common, from the *Peritonæum*; besides they have veins, nerves and arteries from the neighbouring parts.

The substance, magnitude, figure and composure of the Ureters.

They be two in number, on each side one; they are situate between the Kidneys (out of whose hollow part they proceed) and the bladder. But the manner how the Ureters insert or enter themselves into the bladder, and the *Porus Cholagogus* into the *Duodenum*, exceeds admiration; for the ureters are not directly but obliquely implanted neer the orifice of the bladder, and penetrate into the inner space thereof; for within they doe as it were divide the membrane or membranous coat of the body of the bladder, and insinuate themselves into that, as though it were double. But this is opened at the entrance of the urine, but shut at other times, the cover as it were falling upon it, so that the humor which is faln into the capacity of the bladder cannot be forced or driven back, no not so much as the aire blown into it can come this way out, as we see in swines bladders blown up and filled with aire.

Number and site.

For we see it is the Aire contained in these which fills them thus, neither can it be pressed forth but with extraordinary force.

For as this skin or coat turned in by the force of the humor gives way, so it being pressed out by the body contained within, thrusts its whole body into the passage as a stopple; like to this is the insertion of the *Porus Cholagogus* into the Guts.

The ureters have connexion with the above mentioned parts, with the muscles of the loins; upon which they run from the Kidneys to the bladder.

Connexion.

Wherefore nothing hinders, but that the stone sliding through the ureters into the bladder, may stupefie the thigh as much as it did when it was in the Kidney. They are of a cold and dry temper.

Their use is, to serve as passages, or channels for carrying the urine into the bladder.

Temper and use.

CHAP. XXXI.

Of the Bladder.

THe bladder is of the same substance that the ureters, that is, nervous, that so it may be the more easily dilated.

The substance.

It is of a large proportion, in some bigger, in some lesse, according to the difference of age, and habit of body. It is of a round figure and as it were Pyramidall.

Figure.

It

Compoſition. It is compoſed of the two coats,one proper, which is very thick and ſtrong, compoſed of the three ſorts of fibers,that is,in the inner ſide of the direct; without of the tranſverſe;and in the midſt of the oblique. The other common Coat coming from the *Peritonæum* hath veins and arteries on each ſide one, from the *Hypogaſtrick* veſſels above the holy-bone, alſo it hath nerves on each ſide from the ſixt conjugation mixt with the nerves of the holy-bone.

For theſe nerves deſcend from the brain even to the end of the holy-bone.

It is but one and that ſituate in men in the lower belly upon the right gut and below the ſhare-bone,but in women between the womb and that bone, to which it cleaves with its membranous ligaments,as it doth to the yard by its neck,and to the right gut by its common coat and proper veſſels. It is of a cold and dry temper.

Temper,uſe or action. The uſe and action thereof is by the fibers continually to draw the urine, and contain it as long as need requires,and then to expell it by the neck,partly by compreſſion either of it ſelf, or rather to the muſcles of the *Epigaſtrium* and midriffe,becauſe this motion, ſeeing it is voluntary cannot be performed unleſs by a muſcle which the bladder wants; partly by the dilatation and relaxation of the Sphincter muſcle compoſed of tranſverſe fibers, like the ſphincter of the fundament, after the ſame manner to ſhut up the orifice of the bladder,that the urine flow not out againſt our will. But the bladder as it fils is dilated, but as it is emptyed,it is contracted like a purſe. You may eaſily obſerve this Muſcle in a Sows bladder, it is ſtretched from the orifice of the bladder and beginning of the urinary paſſage even to the privities even in women;but in man it is terminated in the *Peritonæum* as ſoon as it hath left the right Gut. Beſides,this muſcle is thus far ſtretched forth, that the urine by its compreſſion ſhould be wholly preſſed out of the bladder, which by too long ſtay would by its acrimony do ſome harm.This is the common opinion of Anatomiſts concerning the Sphincter of the bladder,which nevertheleſs *Fallopius* allows not of. For (ſaith he) if this muſcle ſhould be ſituate beneath the glandulous bodies, the ſeed in copulation could never be caſt forth without ſome ſmall quantity of urine. Wherefore he thinks that this muſcle is ſituate above the *Proſtats*,and that it is nothing elſe but the beginning of the neck of the bladder, which becomes more fleſhy whilſt it is woven with tranſverſe fibers.

Their Sphincter of the bladder.

The eleventh figure of the Bladder and Yard.

AB,1,2,3,4,5,7,9,the two bodies which make the yard.

CC, 2, 3, the place where theſe two bodies do firſt ariſe.

D, 1,2,3,4,5,7,9, the nut of the yard called *glans penis*.

EE,4,5, the fungous and red ſubſtance of the bodies of the yard.

F,4, 5, the mutuall connexion of the bodies of the yard,and the nervous outward ſubſtance of the ſame, compaſſing round about the former fungous ſubſtance.

G,1,2,3,4,5,7,9, the paſſage of the Urine, or common pipe running under the yard all along his length.

H,I,1,2; the firſt pair of Muſcles of the yard, which in the firſt figure do yet grow to it, but in the ſecond they hang from their originall.

K,L,1,2,the ſecond pair of Muſcles of the yard,in the firſt figure growing,in the ſecond hanging from their inſertion. M,1, 2,the Sphincter of the right gut.N,3,7,8,9,the round ſphincter Muſcle of the bladder. OO, a Membrane which is over the holes of the ſhare-bone.P,2,a round Ligament from the meeting of the ſhare-bones on the head of the thigh. Q,3,7,8.the body of the bladder. RR,3,7, the *Proſtatæ*, which into ſeed when it is perfectly laboured, is led. SS,3,8,Portions of the ureters.TT*3, Portions of the veſſels,which lead down the ſeed. VV,7,8,the umbilicall arteries. X,7,8, the ligament of the bladder cald *Urachus*. Y,7,8 the navil or *umbilicus*.Z,7,8,the umbilicall vein.*aa*, 7,the vein and artery of the yard.*b*,5. the artery diſtributed through the body of the yard.

For

For the neck of the bladder it differs nothing in ſubſtance, compoſure, number, and temper from the bladder, but only in quantity, which is neither ſo large, nor round in figure, but ſomewhat long together with the yard repreſenting the ſhape of the letter S. It is placed in men at the end of the right Gut and *Perinæum*, riſing upwards even to the roots of the yard, and with it bending it ſelf downwards; in women it is ſhort, broad, and ſtreight, ending at the orifice of the neck of the womb between the nervous bodies of the *Nymphæ*. The neck of the bladder.

In men it hath connexion with the bladder, the ejaculatory veſſels, the right gut and yard, but in women only with the neck of the wombe and privities. The uſe of it is in men to caſt forth ſeed and urine, in women only urine. But we muſt note that the ſhare bones muſt be divided and pulled aſunder, in that part where they are joyned, that ſo you may the more exactly obſerve the ſituation of theſe parts. Beſides you muſt note that by the *Perinæum* we underſtand nothing elſe, in men and women, then that ſpace which is from the fundament to the privities, in which the ſeam is called *Taurus*. The connexion and uſe thereof.

CHAP. XXXII.

Of the Yard.

NOw follows the declaration of the Privy parts of men and women, and firſt we will treat of mens. The yard is of a ligamentous ſubſtance, becauſe it hath its originall from bones, it is of an indifferent magnitude in all dimenſions, yet in ſome bigger, in ſome leſs; the figure of it is round, but yet ſomewhat flatted above and beneath. The ſubſtance, quantity and figure of the yard.

It is compoſed of a double coat, nerves, veins, arteries, two ligaments, the paſſage of the urine, and four muſcles. It hath its coats both from the true skin, as alſo from the fleſhy pannicle, but the veins and Arteries from theſe of the lower part of the lower belly which run on the lower part of the Holy-bone into the yard, as the ſeminary veſſels run on the upper part. Compoſure.

The ligaments of the yard proceed on both ſides from the ſides and lower commiſſure of the ſhare-bones; wherefore the yard is immediately at his root furniſhed with a double ligament, but theſe two preſently run into one ſpungy one. The paſſage of the urine ſituate in the lower part of the yard comes from the neck of the bladder between the two ligaments. The ligaments.

For the four muſcles, the two ſide ones compoſing or making a great part of the yard, proceed from the inward extuberancy of the Hip-bone, and preſently they are dilated from their originall; and then grow leſs again. The two other lower ariſe from the muſcles of the fundament and accompany the urinary paſſage the length of the *perinæum* untill they enter the yard; but theſe two muſcles cleave ſo cloſe together, that they may ſeem one having a triangular form. The muſcles.

The action of theſe four muſcles in the act of generation is, they open and dilate this common paſſage of urine and ſeed, that the ſeed may be forcibly or violently caſt into the field of nature; and beſides they then keep the yard ſo ſtiffe, that it cannot bend to either ſide. Their Action.

The yard is in number one, and ſituate upon the lower parts of the ſhare-bone, that it might be more ſtiffe in erection. It hath connexion with the ſhare-bone and neighbouring parts; by the particles of which it is compoſed. It is of a cold and dry temper. The action of it is to caſt the ſeed into the womb, for preſervation of mankind.

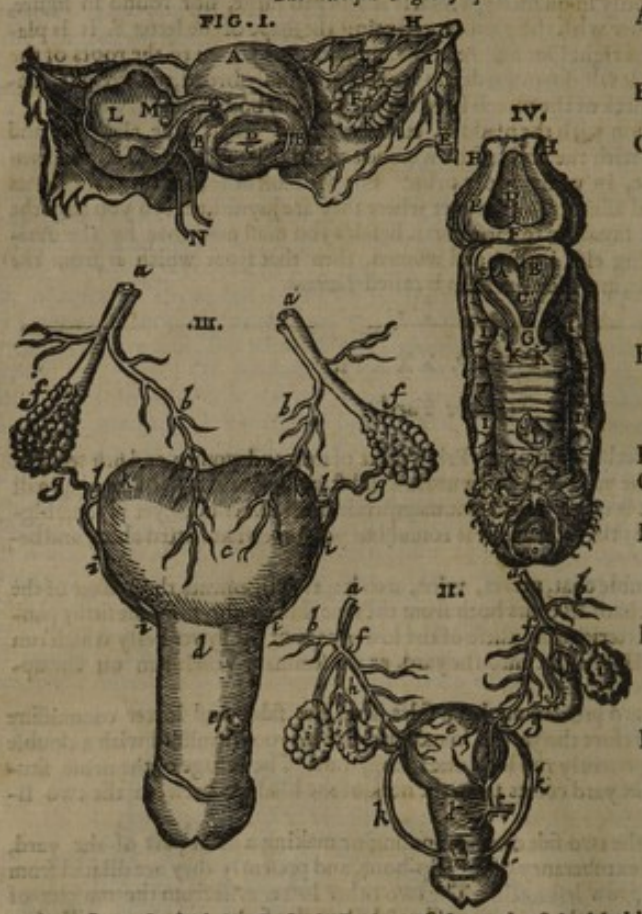
The head of it begins where the tendons end, this head from the figure thereof is called *Glans* and *Balanus*, that is, the Nut, and the skin which covers that head is called *Præputium*, that is, the foreskin. The fleſh of this *Glandule* is of a middle nature between the glandulous fleſh and true skin. But you muſt note that the Ligaments of the yard are ſpongy contrary to the condition of others, and filled with groſs and black blood. But all theſe ſtirred up by the delight of deſired pleaſure, and provoked with a venereall fire, ſwell up and erect the yard. The Nut. The *Præputium*, or foreskin.

CHAP. XXXIII.

Of the ſpermatick veſſels and teſticles in women.

NOw we ſhould treat of the Privy parts in women, but becauſe they depend upon the neck and proper body of the womb, we will firſt ſpeak of the womb, having firſt declared what difference there is between the ſpermatick veſſels and teſticles of men and women. Wherefore we muſt know that the ſpermatick veſſels in women do nothing differ from thoſe in men in ſubſtance, figure, compoſure, number, connexion, temper, originall and uſe; but only in magnitude and diſtribution, for women have them more large and ſhort. In what the ſpermatick veſſels in women differ from thoſe in men.

The twelfth Figure, of the Womb.



A. The bottome of the womb laid open without any membrane.
BB. the neck of the womb turned upward.
CD. a part of the bottom of the womb like the nut of the yard, swelling into the upper part of the neck of the womb, in the middle whereof the orifice appeareth.
EE. a membrane knitting the womb to the *Peritonæum*, & holding together the vessels thereof.
F. the left testicle.
G. the spermaticall vein and artery.
H. a part of the spermaticall vessels reaching unto the bottom of the womb.
I. one part of the vessels coming to the testicles *a vessell leading the seed unto the womb.
K. the coat of the testicle with the implication of the vessels. L. the cavity of the bladder opened. M. the insertion of the Ureters into the bladder. N. the Ureters cut from the kidnies. O. the insertion of the neck of the bladder into the lap or privity.

The second Figure.

aa. The spermaticall vein and artery. *bb.* branches distributed to the *Peritonæum* from the spermatical vessels. *c.* the bottom of the womb. *d.* the neck of the womb. *e.* certain vessels running through the inside of the womb, and the neck thereof. *ff.* vessels reaching to the bottom of the womb produced from the spermaticall vessel. *gg.* the leading vessell of the seed called *Tuba*, the Trumpet. *hh.* a branch of the spermaticall vessel compassing the Trumpet. *ii.* the testicles. *kk.* the lower ligaments of the womb, which some cal the Cremasters or hanging muscles of the womb. *l.* the lap or privity into which the Cremasters do end. *m.* a portion of the neck of the bladder.

The third Figure.

aa. The spermaticall vessels. *bb.* a branch from these spermaticall vessels to the bottom of the womb. *cc.* the body or bottom of the womb. *d.* the neck of the same. *e.* the neck of the bladder ending into the neck of the womb. *ff.* the testicles. *gg.* the leading vessels, commonly though not so well called the ejaculatory vessels. *hh.* the division of these vessels, one of them determining into the horns at double *kk. ii.* the other branch ending in the neck, by which women with child avoid their seed. *kk.* the horns of the womb.

The fourth Figure.

AB. The bosome of the bottom of the womb, at whose sides are the horns. CD. a line like a suture or seam, a little distinguishing that bosome. EE. the substance of the bottom of the womb, or the thickness of his inner coat. F. a protuberation or swelling of the womb in the middle of the bosom. G. the orifice of the bottom of the womb. HH. the coat or second cover of the bottom of the womb, coming from the *Peritonæum*. IIII. a portion of the membranes which tie the womb. KK. the beginning of the neck of the bladder inserted into the neck of the womb. *m.* the *Clitoris* in the top of the privity. *n.* the inequality of the privity where the *hymen* is placed. *o.* the hole or passage of the privity in the cleft. *p.* the skinny caruncle of the privity.

Why womans spermatick vessels they are larger, but shorter then mens.

It was fit they should be more large, because they should not only convey the matter fit for generation of young and nourishment of the testicles, but also sufficient for the nourishment of the womb and child; but shorter, because they end at the testicles and womb within the belly in women. Where you must note that the preparing spermatick ves-

sels,

sels, little before they come to the Testicles are divided into two unequall branches, of which the lesser bended, after the same manner as we said in men, goes into the head of the testicle, through which it sends a slender branch into the coats of the testicles for life and nourishment, and not only into the coats but also into leading vessels. But the bigger branch descends on each side by the upper part of the wombe between the proper coat and the common, from the *Peritoneum* where it is divided into divers branches. By this difference of the spermatick vessels you may easily understand why women cast forth less seed than men.

In what their testicles differ from mens.

For their Testicles, they differ little from mens but in quantity; For they are lesser and in figure more hollow and flat, by reason of their defective heat which could not elevate or lift them up to their just magnitude. Their composure is more simple; for they want the *scrotum* or cod, the fleshy coat, and also according to the opinion of some the *Erythroides*, but in place thereof they have another from the *Peritoneum* which covers the proper coat, that is, the *Epididymis*, or *Dartos*. *Silvius* writes that womens Testicles wants the *Erythroides*; yet it is certain that besides their peculiar coat *Dartos*, they have another from the *peritoneum*, which is the *Erythroides*, or as *Fallopius* cals it the *Elythroides*, that is as much as the *vaginalis* or sheath: But I think that this hath sprung from the mis-understanding th at place in *Galen* where he writes, that womens testicles want the *Epididymis*. For we must not understand that to be spoken of the coat, but of the varicous parastats (as I formerly said). They differ nothing in number, but in site; for in men they hang without the belly at the share bone above the *Peritoneum*; women have them lying hid in their belly, neer the bottome at the sides of the wombe, but yet so as they touch not the body of the wombe.

Lib. 14. de us. part.

Site.

But these testicles are tyed to the womb both by a coat from the *Peritoneum*, as also by the leading vessels descending to the horns of the wombe, but to the rest of the body by the vessels and the nerves arising from the holy bone and Costall nerves. They are of a colder Temper than mans. The ejaculatory, or leading vessels in women differ thus from mens, they are large at the beginning, and of a veiny consistence, or substance, so that you can scarce discern them from the coat *Peritoneum*, then presently they become nervous, and waxe so slender, that they may seem broken or torn, though it be not so; but when they come nearer to the horns of the wombe, they are again dilated; in their other conditions, they agree with mens, but that they are altogether more slender and short. They have a round figure, but more intricate windings than mens; I beleeve, that these windings might supply the defect of the varicous Parastats. They are seated between the testicles and wombe, for they proceed out of the head of the testicle, then presently armed with a coat from the *Peritoneum*, they are implanted into the wombe by its horns.

Connexion.

Temper.

Their ejaculatory vessels.

Why they have more intricate windings.

Their site.

CHAP. XXXIIII.

Of the Wombe.

THe Wombe is a part proper only to women, given by nature in stead of the *Scrotum*, as the neck thereof, and the annexed parts in stead of the yard; so that if any more exactly consider the parts of generation in women and men, he shall find that they differ not much in number, but only in situation and use. For that which man hath apparent without, that women have hid within, both by the singular providence of nature, as also by the defect of heat in women, which could not drive and thrust forth those parts, as in men. The womb is of a nervous and membranous substance, that it may be more easily dilated and contracted, as need shall require.

Wherein the privy parts in women differ from those in men.

The magnitude thereof is divers, according to the diversity of age, the use of venery, the flowing of their courses, and the time of conception. The wombe is but small in one of unripe age, having not used venery, nor which is menstrous; therefore the quantity cannot be rightly defined.

The substance and magnitude of the wombe.

The figure of the wombe is absolutely like that of the bladder, if you consider it without the productions, which *Herophilus* called horns, by reason of the similitude they have with the horns of Oxen at their first coming forth. It consists of simple and compound parts. The simple are the veins, arteries, nerves, and coats. The veins and arteries are four in number, two from the preparing spermatick vessels, the two other ascend thither from the *Hypogastrick*, after this manner.

Figure.

The horns of the wombe.

Composure.

The veins and Arteries.

First, these vessels before they ascend on each side to the wombe, divide themselves into two branches, from which othersome go to the lower part of the wombe, othersome to the neck thereof, by which the menstruous blood, if it abound from the conception, may be purged.

Nerves come on both sides to the wombe, both from the sixt conjugation, descending by the length of the back bone, as also from the holy bone, which presently united and joyned together, ascend and are distributed through the wombe, like the veins and arteries.

Nerves.

The utmost or common coat of the wombe, proceeds from the *Peritoneum*, on that

The Coats.

part it touches the holy bone; but the proper it hath from the firſt conformation, which is compoſed of the three ſorts of fibers, of the right on the inſide of the attraction of both ſeeds; the tranſverſe without to expell, if occaſion be; the oblique in the midſt for the due retention thereof.

No cels in the wombe.

The wombe admits no diviſion, unleſs into the right and left ſide, by an obſcure line or ſeam, ſuch as we ſee in the *ſcrotum*, but ſcarce ſo manifeſt; neither muſt we after the manner of the ancients, imagine any other cels in the wombe. For by the law of nature, a woman at one birth can have no more than two. An argument hereof is, they have no more than two dugs. If any chance to bring forth more, it is beſides nature, and ſomewhat monſtrous, becauſe nature hath made no proviſion of nouriſhment for them.

The ſite.

Nature hath placed the wombe at the bottome of the belly, becauſe that place ſeems moſt fit to receive ſeed, to carry and bring forth the young. It is placed between the bladder and right gut, and is bound to theſe parts much more ſtraitly by the neck, than by the body thereof; but alſo beſides it is tyed with two moſt ſtrong ligaments on the ſides, and upper parts of the ſharebone, on which it ſeems to hang; but by its common coat from the *Peritonæum*, chiefly thick in that place, it is tied to the hollow bone, and the bones of the hanch and loins.

The temper and action.

By reaſon of this ſtrait connexion, a woman with child feeling the painfull drawings back, and as it were convulſions of thoſe ligaments, knows her ſelf with child. It is of a cold and moiſt temper, rather by accident, than of it ſelf. The action thereof is to contain both the ſeeds, and to cheriſh, preſerve, and nouriſh it, ſo contained, untill the time appointed by nature; and alſo beſides, to receive, and evacuate the menſtruous blood. The compound parts of the wombe are, the proper body and neck thereof. That body is extended in women big with child, even to the navell, in ſome higher, in ſome lower.

The *Cotyledones*.

In the inner ſide the *Cotyledones* come into our conſideration, which are nothing elſe than the orifices and mouths of the veins, ending in that place. They ſcarce appear in women, unleſs preſently after child-bearing, or their menſtruall purgation; but they are apparent in ſheep, Goats, and Kine, at all times like wheat corns, unleſs when they are with young, for then they are of the bigneſs of haſell nuts: but then alſo they ſwell up in women, and are like a rude peece of fleſh of a finger and a half thick; which begirt all the naturall parts of the infant ſhut up in the wombe; out of which reſpect this ſhapeles fleſh, according to the opinion of ſome, is reckoned amongſt the number of coats inveſting the infant, and called *Chorion*, becauſe, as in beaſts, the *Chorion* is interwoven with veins, and arteries, whence the umbilicall veſſels proceed; ſo in women this fleſhy lump is woven with veins, and arteries, whence ſuch veſſels have their originall. Which thing, how true and agreeable to reaſon it is, let other men judg.

Columbus juſtly reproved.

There is one thing whereof I would admoniſh thee, that as the growth of the *Cotyledones* in beaſts are not called by the name of *Chorion*, but are only ſaid to be the dependents thereof, ſo in women ſuch ſwollen *Cotyledones* merit not the name of *Chorion*, but rather of the dependences thereof.

The orifice of the wombe.

This body ends in a certain ſtraitneſs which is met withall, in following it towards the privities, in women which have borne no children, or have remained barren ſome certain time; for in ſuch as are lately delivered, you can ſee nothing but a cavity and no ſtraitneſs at all. This ſtraitneſs we call the proper orifice of the wombe, which is moſt exactly ſhut after conception, eſpecially untill the membrane, or coats incompaſſing the child be firniſhed, and ſtrong enough to contain the ſeed, that it flow not forth, nor be corrupted by entrance of the air; for it is opened to ſend forth the ſeed, and in ſome the courſes and ſerous humors, which are heaped up in the wombe in the time of their being with child.

The proper orifice of the wombe is not alwayes exactly ſhut in women with child.

The neck of the wombe.

From this orifice the neck of the wombe taking its originall, is extended even to the privities. It is of a muſculous ſubſtance, compoſed of ſoft fleſh, becauſe it might be extended and contracted, wrinckled, and ſtretched forth, and unfolded, and wreſted, and ſhaken at the coming forth of the child, and after be reſtored to its former ſoundneſs and integrity. In proceſs of age it grows harder, both by uſe of venery, and alſo by reaſon of age, by which the whole body in all parts thereof becomes dry and hard. But in growing, and in young women, it is more tractable and flexible for the neceſſity of nature.

Its magnitude. Compoſition.

The magnitude is ſufficiently large in all dimenſions, though divers, by reaſon of the infinite variety of bodies. The figure is long, round, and hollow. The compoſition is the ſame with the wombe, but it receives not ſo many veſſels as the wombe; for it hath none but thoſe which are ſent from the *Hypogaſtrick* veins, by the branches aſcending to the wombe. This neck on the inſide is wrinckled with many creſts, like the upper part of a dogs mouth, ſo in copulation to cauſe greater pleaſure by that inequality, and alſo to ſhorten the act.

Number and ſite.

It is only one, and that ſituate between the neck of the bladder and the right gut, to which it cloſely ſticketh; as to the wombe by the proper orifice thereof, and to the privities by its own orifice; but by the veſſels to all the parts from whence they are ſent.

Temper.

It is of a cold and dry temper, and the way to admit the ſeed into the wombe, to exclude the infant out of the wombe, as alſo the menſtruall evacuation. But it is worth obſervation,

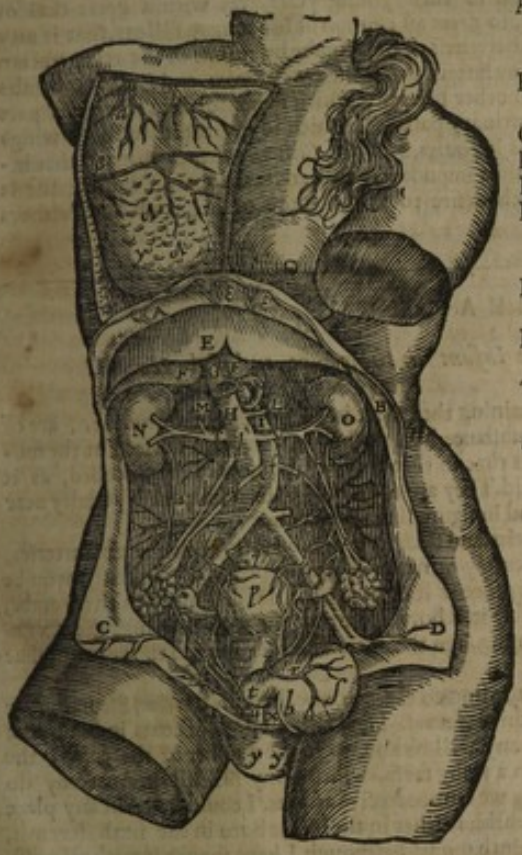
vation, that in all this paſſage there is no ſuch membrane found, as that they called *Hymen*, which they feigned to be broken at the firſt coition. Yet notwithſtanding *Columbus*, *Falloppius*, *Wierus*, and many other learned men of our time think otherwiſe, and ſay, that in Virgins a little above the paſſage of the urine, may be found and ſeen ſuch a nervous membrane, placed overthwart as it were in the middle way of this neck, and perforated for the paſſages of the courſes. But you may find this falſe by experience; it is likely the ancients fell into this error through this occaſion, becauſe that in ſome a good quantity of blood breaks forth of theſe places at the firſt copulation.

No *Hymen*.

But it is more probable, that this happens by the violent artrition of certain veſſels lying in the inward ſuperficies of the neck of the wombe, not being able to endure without breaking ſo great extention as that nervous neck undergoes at the firſt coition. For a maid which is mariageable, and hath her genitall parts proportionable in quantity and bigneſs to a mans, ſhall find no ſuch effuſion of blood, as we ſhall ſhew more at large in our Book of Generation.

From whence the blood proceeds that breaks forth in ſome virgins at the firſt coition.

The thirteenth Figure, ſhewing the parts of women different from theſe in men.



A.B.C.D. The *Peritonæum* reflected or turned backward, above and below.
E.F. the gibbous part of the liver E, the cave or hollow part F.
G. the trunk of the gate-vein.
H. the hollow vein.
I. the great artery.
K. the roots of the *Cœlicall* artery which accompanieth the gate-vein.
L.M. the fatty vein going to the coat of the kidneys.
N. O. the fore-part of both the kidneys.
T. V. the emulgent veins and arteries.
aa. the right ureter at the lowſt *a*, cut from a part which neer to *b*, ſticketh yet to the bladder, becauſe the bottome of the bladder is drawn to the left ſide.
c. the left ureter inſerted into the bladder neer to *r*.
dd. the ſpermatick vein which goeth to the left teſticle marked with *i*.
ee. the ſpermatick vein which goeth to the left teſticle with *i*, alſo. *f.* the trunk of the great artery from whence the ſpermatical arteries do proceed. *gh.* the ſpermatical arteries.
ii. the two teſticles. *ll*, a branch which from the ſpermatick veſſels reacheth unto the bottome of the wombe. *mm.* the leading veſſel of the ſeed which *Falloppius* calleth the *tuba* or trumpet, becauſe it is crooked and reflected. *n.* a branch of the ſpermatick veſſel, compaſſing the leading veſſel. *oo.* a veſſell like a worm which paſſeth to the wombe, ſome call it *Cremaſter*. *p.* the bottome of the wombe called *fundus uteri*. *q.* a part of the right gut. *r. ſ.* the bottome of the bladder whereto is inſerted the left ureter, and a vein led from the neck of the wombe neer unto *r*. *t.* the neck of the bladder. *u.* the ſame inſerted into the privity or lap. *x.* a part of the neck of the wombe above the privity. *yy.* certain skinny Caruncles of the privities, in the midſt of which is the ſlit, and on both ſides appear little hillocks.

The Figures belonging to the Dugs and Breaſts.

aa The veins of the Dugs which come from thoſe, which deſcending from the top of the ſhoulder, are offered to the skin. *ß.* the veins of the dugs derived from thoſe which through the arm-hole are led into the hand. *γ.* the body of the Dug or Breaſt. *δδ.* the kernels and fat between them. *εε.* the veſſels of the dugs deſcending from the lower part of the neck called *jugulum*, under the breaſt bone.

This neck ends at the privities, where its proper orifice is, which privy parts we muſt treat of, as being the productions and *appendices* of this neck. This *Pudendum*, or privity, is of a middle ſubſtance, between the fleſh and a nerve; the magnitude is ſufficiently large, the figure, round, hollow, long. It is compoſed of veins, arteries, nerves, deſcending to the neck of the wombe, and a double coat proceeding from the true skin and fleſhy pannicle; both theſe coats are firmly united by the fleſh coming between them; whereupon it is ſaid, that this part conſiſts of a muſculous coat. It is one in number, ſituate above the *Peritoneum*. It hath connexion with the fundament, the neck of the wombe and bladder by both their peculiar orifices.

It hath a middle temper, between hot, and cold, moiſt and dry. It hath the ſame uſe as a mans *Præputium* or fore-skin, that is, that together with the *Nymphæ* it may hinder the entrance of the air, by which the wombe may be in danger to take cold. The lips of the privities called by the Greeks νύμφαι, by the Latines *Alæ*, contain all that region which is inveſted with hairs; and becauſe we have faln into mention of theſe *Nymphæ*, you muſt know that they are as it were productions of the muſculous skin, which deſcend on both ſides, from the upper part of the ſhare-bone downwards; even to the orifice of the neck of the bladder, oft times growing to ſo great a bigneſs, that they will ſtand out like a mans yard. Wherefore in ſome they muſt be cut off in their young years, yet with a great deal of caution, leſt if they be cut too raſhly, ſo great an effuſion of blood may follow, that it may cauſe, either death to the woman, or barreneſs of the wombe by reaſon of the refrigeration by the too great effuſion of blood. The latter Anatomiſts, as *Columbus* and *Falloppius*, beſides theſe parts, have made mention of another particle, which ſtands forth in the upper part of the privities, and alſo of the urinary paſſage, which joyns together thoſe wings we formerly mentioned. *Columbus* cals it *Tentigo*, *Falloppius*, *Cleitoris*, whence proceeds that infamous word *Cleitorizein*, (which ſignifies impudently to handle that part.) But becauſe it is an obſcene part, let thoſe which deſire to know more of it, read the Authors which I cited.

Alæ. νύμφαι.

Cleitoris, tentigo.

CHAP. XXXV.

Of the Coats containing the Infant in the wombe, and of the Navell.

THe membranes or coats containing the Infant in the wombe of the mother, are of a ſpermatick and nervous ſubſtance, having their matter from the ſeed of the mother. But they are nervous that ſo they may be the more eaſily extended, as it ſhal be neceſſary for the child. They are of good length and bredth, eſpecially near the time of deliverance, they are round in figure like the wombe.

Their ſubſtance, magnitude, figure, and compoſure.

Their compoſition is of veins, arteries, and their proper ſubſtance. The veins, and arteries, are diſtributed to them (whether obſcurely or manifeſtly, more or fewer) from the wombe by the *Cotyledones*, which have the ſame office, as long as the child is contained in the wombe, as the nipples or paps of the nurſes after it is born. For thus the wombe brings the *Cotyledones*, or veins, degenerating into them through the coats like certain paps to the infant ſhut up in them.

The number.

Theſe coats are three in number according to *Galen*; one called the *Chorion*, Secundine, or afterbirth; the other *Allantoides*; the third *Amnios*. I find this number of coats in beaſts, but not in women, unleſs peradventure any will reckon up in the number of the coats, the *Cotyledones* ſwollen up, and grown into a fleſhy maſs, which many skilfull in Anatomy do write, which opinion notwithſtanding we cannot receive as true. I could never in any place find the *Allantoides* in women with child, neither in the infant born in the ſixth, ſeventh, eight, or in the full time, being the ninth month, although I have ſought it with all poſſible diligence, the Midwives being ſet apart, which might have violated ſome of the coats.

But thus I went about this buſineſs, I divided the dead body of the mother croſwiſe upon the region of the wombe, and taking away all impediments which might either hinder, or obſcure our diligence, with as much dexterity as was poſſible, we did not only draw away that receptacle or den of the Infant, from the inward ſurface of the wombe, to which it ſtuck by the *Cotyledones*, but we alſo took away the firſt membrane which we called *Chorion*, from that which lies next under it, called *Amnios*, without any rending or tearing; for thus we powred forth no moiſture, whereby it might be ſaid, that any coat made for the containing of that humor, was rent or torn. And then we diligently looked, having many witneſſes and ſpectators preſent, if in any place there did appear any diſtinction of theſe two membranes, the *Allantoides* and *Amnios*, for the ſeparating the contained humors, and for other uſes which they mention.

But when we could perceive no ſuch thing, we took the *Amnios* filled with moiſture on the upper ſide, and having opened it, two ſervants ſo holding the apertion, that no moiſture might flow out of it into the circumference of the *Chorion* or wombe, then preſently

with

with ſpunges we drew out by little and little all the humidity contained in it, the infant yet contained in it, which was fit to come forth, that ſo the coat *Amnios* being freed of this moiſture, we might ſee whether there were any other humor contained in any other coat beſides. But having done this with ſingular diligence and fidelity, we could ſee no other humor, nor no other ſeparation of the membranes beſides.

He ſhews by three ſeverall reaſons that there is no Allantoides.

So that, from that time I have confidently held this opinion, that the infant in the womb, is only wrapped in two coats, the *Chorion* and *Amnios*. But yet not ſatisfied by this experience, that I might yet be more certain concerning this *Allantoides*, having paſſed through the two former coats, I came to the infant, and I put a quil into its bladder, and blew it up as forcibly as I could, ſo to try, if by that blowing I might force the air into that coat which we queſtioned, as ſome have written. But neither thus could I drive any air from hence, through the navell into the controverted coat, but rather I found it to fly out of the bladder by the privities. Wherefore I am certainly perſwaded that there is no *Allantoides*. Moreover I could never finde nor ſee in the navell that paſſage called the *Urachus*, which they affirm to be the beginning and originall of the coat *Allantoides*. But if it be granted, that there is no ſuch coat as the *Allantoides*, what diſcommodity wil ariſe hereof? ſpecially ſeeing the ſweat and urine of the infant may eaſily, and without any diſcommodity be received, collected, and contained in the ſame coat, by reaſon of the ſmall difference which is between them. But if any object, That the urine by its ſharpneſs and touching will hurt the infant: I will anſwer, there can be no ſo great ſharpneſs in the urine of ſo ſmall an infant; and that, if that there be any, it is tempered by the admixture of the gentle vapor of ſweat.

Beſides, if you conſider, or have regard to the uſe of ſuch an humor (which is to hold up the child, leſt by its weight it break the ties, by which it is bound to the womb;) we ſhall finde no humor more fit for this purpoſe than this ſerous, as which by its thickneſs is much more fit to bear up a weight, than the thin and too liquid ſweat. For ſo we ſee the ſea or ſalt-water carries greater weights without danger of drowning than freſh rivers do. Wherefore I conclude that there is no need, that the urine ſhould be kept and contained in one coat, and the ſweat in another. The Ancients who have writ otherwiſe, have written from obſervations made in beaſts. Wherefore we make but only two coats, the *Chorion* and *Amnios*; the one of which, ſeeing it contains the other, they both ſo encompaſs the child, that they veſt it on every ſide.

Falloppius in ſome ſort ſeems to be of this opinion; for he only makes two coats, the *Chorion* and *Amnios*; but he thinks the infant makes the water into a certain part of the *Chorion*, as you may perceive by reading of his Obſervations. Both theſe coats are tyed between themſelves by the intercourſe of moſt ſlender nervous fibers, and ſmall veſſels penetrating from the outer *Chorion* to the inner *Amnios*. Wherefore unleſs you warily handle theſe coats, you may eaſily tear the *Amnios* in ſeparating it. They are of the ſame temper with other membranes. Their uſe is different, for the *Chorion* is made both for the preſervation of the veſſels, which it receives from the womb for the generating of the umbilicall veins and arteries, as alſo to keep whole and ſafe the parts which it inveſts.

Their temper and uſe.

But the *Amnios* is to receive and contain the excrementitious and ſerous humors, which the childe ſhut up in the womb is accuſtomed to evacuate. But this coat is very thin and ſoft, but ſtrong and ſmooth, leſt by its touch it might hurt the infant, whereupon it is called the Lambskin-coat.

CHAP. XXXVI.

of the Navell.

What the Navell is.

THe Navell follows theſe coats; It is a white body, ſomewhat reſembling the wreathen cord, or girdle of the Franciſcan-friers, but that it hath not the knots ſtanding ſo far out, but only ſwelling in certain places, reſembling a knot, only lifted up on one ſide; it ariſes and takes its originall from a fleſhy maſs, which we expreſſed by the name of ſwelling *Cotyledones*, and goes into the midſt of the lower belly of the infant, yea verily into the midſt of the whole body, whoſe root it is therefore ſaid to be. For even as a tree by the root ſucks nouriſhment from the earth, ſo the infant in the womb draws its nouriſhment by the navell. The greatneſs of it in breadth and thickneſs, equals the bigneſs of the little finger. But it is a foot and a half long, ſo that children are brought forth with it, encompaſſing their middle, neck, arms, or legs. The figure of it is round. It is compoſed of two arteries, one vein, and two coats. It hath theſe veſſels from that great multitude of capillary veins and arteries, which are ſeen diſperſed over the *Chorion*. Wherefore the vein entring in at the Navell, penetrates from thence into the hollow part of the Liver, where divided into two, according to *Galens* opinion, it makes the gate and hollow veins. But the arteries, carried by

The Navell is the center of the body.

The figure and compoſure.

Lib. de format. fœtus in utero.

by themſelves the length of the Navell, caſt themſelves into the *Iliaca*, which they make, as alſo all other, that from thence the vitall ſpirit may be carried by them over all the infant. It hath its two coats from the *Chorion*.

But ſeeing they are mutually woven and conjoined without any *medium*, and are of a ſufficient ſtrength and thickneſs over all the Navell, they may ſeem to make the infants externall skin and fleſhy Pannicle. I know very many reckon two Umbilicall veins, as alſo arteries, and the *Urachus*, by, or through which the urine flows into the coat *Allantoides*. But becauſe this is not to be found in women, but only in beaſts, I willingly omit it, becauſe I do not intend to mention any parts, but ſuch as belong to humane bodies. Yet if there be any, which can teach me, that theſe parts, which I think proper to brute beaſts, are to be found in women, I willingly confeſs, and that to his credit, from whom I have reaped ſuch benefit.

There is only one Vein in a childs Navell, but no Urachus.

The other things that may be required concerning the Navell, as of its number, ſite, connexion, temper and uſe, may eaſily appear by that we have ſpoken before. For we have apparently ſet down the uſe, when we ſaid, the Navell was made for that purpoſe, that the infant may be nouriſhed by it, as the tree by the root, by reaſon of the continuation of the veſſels thereof, with the preparing ſpermatick veſſels made by God for that purpoſe, to whom be honor and glory for ever and ever. *Amen.*

The End of the third Book.

The Fourth Book,

Treating of the Vitall parts contained in the CHEST.

The PREFACE.

HAving finiſhed the firſt Book of our Anatomy, in explanation of the naturall parts contained in the lower belly, now order requires, that we treat of the Breſt; that ſo the parts in ſome ſort already explained (I mean the veins and arteries) may be diſpatched after the ſame order and manner, without interpoſition of any other matter.

And beſides alſo that we may the more exactly and chearfully ſhew the reſt of the parts which remain, as the head and limbs, knowing already the originall of thoſe veſſels which are diſperſed through them. To this purpoſe, we will define what the Cheſt is, and then we wil divide it into its parts. Thirdly, in theſe we will conſider which parts contain, and which are contained, that ſo we may more happily finiſh our intended diſcourſe.

CHAP. I.

What the Thorax or the Cheſt is; into what parts it may be divided, and the nature of theſe parts.

THe *Thorax*, or Cheſt, is the middle belly, terminated or bounded above with the coller-bones, below with the Midriff, before with the *Sternum* or breſt, behinde, with the twelve *Vertebra*'s of the back on both ſides, with the true and baſtard ribs, and with the intercoſtall and intercartilagineous muſcles. Nature hath given it this ſtructure and compoſition, leſt that being a defence for the vitall parts againſt externall injuries, it ſhould hinder reſpiration; which is no leſs needfull for the preſervation of the native heat diffuſed by the vital ſpirits, and ſhut up in the heart, as in the fountain thereof, againſt internall injuries, than the other forementioned parts againſt externall. For if the Cheſt ſhould have been all bony, verily it had been the ſtronger, but it would have hindred our reſpiration or breathing, which is performed by the dilating and contracting thereof. Wherefore leſt one of theſe ſhould hinder the other, Nature hath framed it, partly bony and griſly, and partly fleſhy. Some render another reaſon hereof, which is, that Nature hath framed the cheſt, that it might here alſo obſerve the order uſed by it in the fabrick of things, which is, that it might conjoin the parts much diſagreeing in their compoſure, as the lower belly, altogether fleſhy, and the head all bony, by a medium partaker both of the bony and fleſhy ſubſtance; which courſe we ſee it hath obſerved in the connexion of the fire and water, by the interpoſition of the air; of the earth and air, by the water placed between them.

The containing parts of the Cheſt.

Why nature hath made the Cheſt partly bony, partly griſly.

The Cheſt is divided into three parts, the upper, lower, and middle; the coller-bones contain the upper; the Midriff the lower; and the *Sternon* the middle. The *Sternon* in *Galens* opinion is compoſed of ſeven bones, I beleeve by reaſon of the great ſtature of the people that lived then. Now in our times, you ſhall oft find it compact of three, four, or five bones, although we wil not deny, but that we have often obſerved it (eſpecially in young bodies) to conſiſt of ſeven or eight bones.

The number of the bones of the Sternon.

Wherefore thoſe who have fewer bones in number in their *Sternon*, have them larger, that they might be ſufficient to receive the ribs. This is the common opinion of the *Sternon*. Yet *Fallopius* hath deſcribed it far otherwiſe; wherefore let thoſe who deſire to know more hereof, look in his obſervations.

At the lower part of the *Sternon*, there is a griſle, called commonly *Furcula*, and *Malum granatum*, or the Pomgranate, becauſe it reſembles that fruit; others call it *Cartilago ſcutiformis*, that is, the breſt-blade.

Cartilago ſcutiformis, the breſt-blade.

It

It is placed there, to be (as it were) a bulwark or defence to the mouth of the ſtomach, endued with moſt exquiſit ſenſe; and alſo that it ſhould do the like to that part of the Midriff which the Liver bears up in that place, ſituate above the orifice of the ventricle by the ligament coming between, deſcending from the lower part of the ſame griſle into the upper part of the Liver.

The common people think that this griſle ſometimes fals down. But it ſo adheres, and is united to the bones of the *Sternon*, that the falling thereof may ſeem to be without any danger, although oft-times it may be ſo moiſtened with watery and ſerous humidities, with which the orifice of the ſtomach abounds, that (as it were) ſoaked and drunk with theſe, it may be ſo relaxed, that it may ſeem to be out of its place; in which caſe it may be preſſed and forced by the hand into the former place and ſeat, as alſo by applying outwardly, and taking inwardly aſtringent and drying medicines to exhauſt the ſuperfluous humidity.

This Griſle at its beginning is narrow, but more broad and obtuſe at its end, ſomewhat reſembling the round or blunt point of a ſword, whereupon it is alſo called *Cartilago Enſiformis*, or the ſword-like griſle. In ſome it hath a double, in others a ſingle point.

In old people, it degenerates into a bone. Now becauſe we make mention of this griſle, we will ſhew both what a Griſle is, and how many differences thereof there be, that henceforward as often as we ſhall have occaſion to ſpeak of a griſle, you may underſtand what it is.

What a Griſle is. A Griſle is a ſimilar part of our bodies, next to a bone moſt terreſtriall, cold, dry, hard, weighty, and without ſenſe, differing from a bone in drineſs only, the which is more in a bone. Wherefore a Griſle being loſt, cannot be regenerated, like as a bone, without the interpoſition of a *Callus*.

The differences thereof. The differences of theſe are almoſt the ſame with bones, that is, from their conſiſtence, ſubſtance, greatneſs, number, ſite, figure, connexion, action, and uſe. Omitting the other for brevity ſake, I will only handle thoſe differences which ariſe from ſite, uſe and connexion. Therefore griſles, either adhere to the bones, or of, and by themſelves make ſome part, as the griſles of the ey-lids called *Tarſi*, of the *Epiglottis* and throtle. And others which adhere to bones, either adhere by the interpoſition of no medium, as thoſe which come between the bones of the *Sternon*, the coller-bones, the ſhare and haunch-bones, and others; or by a ligament coming between, as thoſe which are at the ends of the baſtard-ribs to the *Sternon* by the means of a ligament, that by thoſe ligaments being ſofter than a griſle, the motions of the Cheſt may be more quickly and ſafely performed. The griſles which depend on bones, do not only yeeld ſtrength to the bones, but to themſelves, and the parts contained in them, againſt ſuch things as may break and bruiſe them. The griſles of the *Sternon*, and at the ends of the baſtard-ribs are of this ſort.

Their twofold uſe. By this we may gather, that the griſles have a double uſe, one to poliſh and levigate the parts to which that ſlippery ſmoothneſs was neceſſary for performance of their duty; and for this uſe ſerve the griſles which are at the joints, to make their motions the more nimble. The other uſe is to defend thoſe parts upon which they are placed, from externall injuries, by breaking violent aſſaults, by ſomewhat yeelding to their impreſſion, no otherwiſe than ſoft things oppoſed againſt cannon-ſhot. We wil proſecute the other differences of griſles in their place, as occaſion ſhall be offered and required.

CHAP. II.

Of the containing and contained parts of the Cheſt.

The diviſion of the Cheſt into its parts. THe containing parts of the Cheſt are both the skins, the fleſhy Pannicle, the fat, the breſts, the common coat of the Muſcles, the muſcles of that place, the forementioned bones, the coat inveſting the ribs, and the *Diaphragma* or Midriff. The parts contained are the *Mediaſtinum*, the *pericardium* or purſe of the heart, the heart, the lungs and their veſſels. Of the containing parts, ſome are common to all the body, or the moſt part thereof, as both the skins, the fleſhy pannicle and fat. Of which being we have ſpoken in our firſt Book, there is no need now further to inſiſt upon: Others are proper to the Cheſt, as its muſcles, of which we will ſpeak in their place, the breſts, the forementioned bones, the membrane inveſting the ribs, and the *Diaphragma* or Midriff.

We will treat of all theſe in order, after we have firſt ſhewed you the way, how you may ſeparate the skin from the reſt of the Cheſt. Putting your knife down even to the perfect diviſion of the skin, you muſt draw a ſtreight line from the upper part of the lower belly, even to the chin; then draw another ſtreight line, overthwart at the coller-bones even to the ſhoulder-blades; and in the places beneath the coller-bones: (if you deſire to ſhun prolixity) you may at once ſeparate both the skins, the fleſhy Pannicle, the fat, and common coat of the muſcles; becauſe theſe parts were ſhewed and ſpoken of in the diſſection of the lower belly.

Yet

Yet you must reserve the brests in dissecting of the bodies of women; wherefore from the upper parts of the brests, as artificially as you can, separate only the skin from the parts lying under it, that so you may shew the Pannicle which there becometh fleshy and musculous, and is so spred over the neck and parts of the face, even to the roots of the hairs.

CHAP. III.

Of the Brests or Dugs.

THe Brests, as we said, when we spoke of the nature of Glandules, are of a glandulous substance, white, rare, or spongious; in maids and women that do not give suck, they are more solid and not so large. Their substance.

Wherefore the bigness of the Dugs is different, although of a sufficient magnitude in all. Their figure is round, somewhat long, and in some sort Pyramidall. Their composure is of the skin, the fleshy pannicle, glandules, fat, nerves, veins, and arteries, descending to them from the *Axillaris* under the *Sternon*, betwixt the fourth and fifth, and sometimes the sixth of the true ribs. Magnitude Figure. Composure.

And there they are divided into infinite rivelets by the interposition of the glandules and fat, by which fit matter may be brought, to be changed into milk by the faculty of the dugs.

We will speak no more of the nature of glandules or kernels, as having treated of them before; only we will add this, that some of the glandules have nerves, as those of the Brests, which they receive from the parts lying under them, that is, from the intercostall, by which it comes to pass, that they have most exquisit sense. Others want a nerve, as those which serve only for division of the vessels, and which have no action, but only use. Which Glandules have nerves, and which have none.

They be two in number, on each side one, seated at the sides of the *Sternon* upon the fourth, fifth and sixth true ribs.

Wherefore they have connexion with the mentioned parts with their body, but by their vessels with all other parts, but especially with the womb by the reliques of the mamillary veins and arteries, which descend down at the sides of the brest-blade; in which place these veins insinuating themselves through the substance of the muscles, are a little above the navell conjoined with the *Epigastricks*, whose originall is in some sort opposite to the *Hypogastricks*, which send forth branches to the womb. By the meeting of these it is more likely that this commerce should arise, than from other and those almost capillary branches, which are sometimes seen to descend to the womb from the *Epigastrick*. Their connexion. How the brests and womb communicate each with other.

They are of a cold and moist temper, wherefore they say that the blood by being converted into milk * becomes raw, flegmatick and white by the force of the proper flesh of the dugs. Their action is to prepare nourishment for the new-born babe, to warm the heart from whence they have received heat, and to adorn the brest. Their temper. * *Recrudescere.* Their action and use.

By this you may know that some Glandules have action, others use, and some both. At the top of the dugs there are certain hillocks, or eminencies called teats or nipples, by sucking of which the childe is nourished through certain small and crooked passages, which though they appear manifest to the sight, whilst you press out the milk by pressing the dug, yet when the milk is pressed out, they do not appear, nor so much as admit the point of a needle, by reason of the crooked ways made by nature in those passages, for this use, that the milk being perfectly made, should not flow out of its own accord against the nurses will. For so the seed is retained and kept for a certain time in the Prostats. The Nipples.

CHAP. IIII.

Of the Clavicles, or Coller-bones and Ribs.

IF we should handle these parts after the common order, we should now treat of the Muscles of the Chest which move the arm, and serve for respiration, and which first offer themselves to our sight.

But for that they cannot be fitly shewed, unless we hurt the muscles of the shoulder-lade and neck, therefore I think it better to defer the explanation of these Muscles, untill such time as I have shewed the rest of the contained and containing parts, not only of the Chest, but also of the Head, that having finished these, we may come to a full demonstration of all the rest of the muscles, beginning with those of the head, which we first meet with, and so prosecuting the rest even to the muscles of the feet, as they shall seem to offer themselves more fitly to dissection, that so, as much as lyes in us, we may shun confusion.

Wherefore to return to our proposed task; after the foresaid muscles come the Coller-bones, the *Sternon*, and Ribs.

But

But that theſe parts may be the more eaſily underſtood, we muſt firſt know what a bone is, and whence the differences thereof are drawn.

What a Bone is.

Therefore a Bone is a part of our body moſt terreſtriall, cold, dry, hard, wanting all manifeſt ſenſe, if the teeth be excepted.

A double ſenſe

I ſaid manifeſt ſenſe, that you may underſtand that the parts have a double ſenſe of touching, the one manifeſt, ſuch as reſides in the fleſh, skin, membranes, nerves, teeth, and certain other parts; the other obſcure, yet which may ſuffice to diſcern the helping and hurting tactile qualities, ſuch ſenſe the bowels and bones have; for very ſmall fibers of the nerves are diſſeminated to theſe parts by mediation of their coat, or membrane, I ſay, ſo ſmall, that they can ſcarce be diſcerned by the eys, unleſs (as *Galen* ſaith) by plucking ſuch coats away from the parts.

Lib. 1. de Locis affectis.

Why the bones have ſuch ſmal veins.

But it is no marvail if Nature would have theſe parts in like manner to have ſuch ſmall veins, contrary to the lungs and moſt part of the muſcles, only to yeeld ſo much nouriſhment to the part, as ſhould be needfull; for ſeeing the ſubſtance of the bones is cold, hard, denſe and ſolid, it waſtes the leſs.

Wherefore they need not ſo much blood for their nouriſhment, as the hot and ſoft parts; and beſides the leſſer bones have neither veins nor arteries, but draw fit nouriſhment, only by the force of the attractive faculty implanted in them.

Whence the difference of bones may be taken.

The differences of bones are taken from many things, as from their *Apophyſes*, *Epiphyſes*, griſles, necks, heads, ſolidity, cavity, eminencies, marrow, conſiſtence, bigneſs, number, figure, ſite. We will proſecute all theſe as they ſhall offer themſelves in the demonſtration of the bones; to which doctrine we will give a beginning at the Clavicles or coller-bones.

The Clavicles or coller-bone.

The Clavicles are two very hard and ſolid bones, without any great or notable cavity, ſituate on each ſide betwixt the ſide and upper part of the *Sternon* and top of the ſhoulder-blade, for the ſtrength and ſtability of theſe parts, whence they take the name of *Clavicule* Clavicles, (from the Greek κλεὶς, which ſignifies, a Key or any other Bar or faſtning of a door.) They carry the ſhape of a Surgeons Levatory.

But you muſt note that the Clavicles ſeem to be faſtned to the *Sternon* by the mediation of a griſly bone. Moreover the ſpace and cavity contained within the coller-bones is called by the Latins *jugulum*, by the French the upper *furcula*, becauſe the jugular veins paſs that way; it ſticks to the upper proceſs of the ſhoulder by a Griſle which *Galen* cals the ſmall griſle bone, although it be nothing elſe but a production of the *Os juguli*.

Lib. 13. de uſu part. cap. 11.

For the *Sternon*, which we ſaid is framed of divers bones, as ſometimes 3, ſometimes 4, 5, 6, 7, and ſometimes 8, you muſt note they are very ſpongy and full of pores, and of a far ſofter conſiſtence than the coller-bones, wherefore more ſubject to corruption; beſides they are mutually joined by interpoſition of muſcles. Their uſe is to be as a ſhield to defend the vitall parts.

The Ribs.

The Ribs are 24 in number, on each ſide 12. ſeven of theſe are called true or perfect ribs, becauſe they make a circle, at the one end joined to the *Sternon*, on the other to the *vertebra's*; the other are called baſtard or ſhort ribs, becauſe they fall ſhort in their way and come not to the *Sternon*; but they are faſtned on the fore-ſide to the *Sternon* by griſles and ligaments, but on the back-part to the tranſverſe *vertebra's* of the back-bone, and to the ſides of the ſaid *vertebra's*. But the ſhort ribs are only knit to the *vertebra's*, wherefore that part of the *vertebra's* is called the root of the ribs.

Their conſiſtence.

The exteriour or fore-part of the baſtard or ſhort ribs is griſly, that they ſhould not be broken, and that they might be the eaſier lifted up in the diſtenſions of the ſtomach filled with meat. They are of a conſiſtence ſufficiently hard, yet more towards their root, than at the *Sternon*, where they come nearer together, and are more hardly broken; they are ſmooth both within and without, but in the midſt they have ſome ſign of being double; or hollow to receive the veins and arteries, which nouriſh their bony ſubſtance; they are faſhioned like a bow; their uſe is the ſame with the *Sternon*, and beſides to carry and ſtrengthen the muſcles ſerving for reſpiration.

CHAP. V.

The Anatomicall adminiſtration of the Sternon.

THe coat inveſting the ribs, which the common Anatomiſts call *Pleura*, is the laſt of the containing parts of the Cheſt, which becauſe it lyes hid in the inner part thereof, it cannot be ſhown unleſs by pulling aſunder of the *Sternon*; wherefore we muſt now ſhew the manner of opening the *Sternon*, that hereby we may not violate the originall or inſertion of any of the muſcles. Wherefore firſt you muſt underſtand that he which will ſhew in their proper place their originall and inſertion of the pectorall muſcles, of the *Maſtoides*, of the two muſcles of the bone *Hyoïs*, of the muſcles *ſubclavii*, and *intercartilaginei*, ought firſt of all to ſeparate all the pectorall muſcles from

the

the *Sternon* and the griſles from the true ribs; then to cut the ligaments, next the bones themſelves, even from the ſixth true rib to the clavicles.

And then ſhewing the *Mediaſtinum* ſtretched under the *Sternon* all the length thereof, he muſt ſeparate the *Sternon* with his knife, and bend it up to the clavicles, and there cut it, reſerving together with it the four muſcles, that is, the two *Maſtoides*, and the two moving the bone *Hyois*, becauſe they either wholly or for the moſt part ariſe from the *ſternon*.

Laſtly, the Clavicles being ſomewhat thruſt upwards, the griſles muſt on each ſide be turned outwards towards the arm; that ſo the containing parts of the Cheſt may not only lye open to view, and be eaſily ſhewed, but alſo the muſcles may be contained in their place, untill they come to be ſhewed in their order.

And becauſe the coller-bones muſt be lifted up very high, that the recurrent nerves may be more eaſily ſeen, and the diſtribution of the veins and arteries, the two ſmall ſubclavian muſcles, one on each ſide muſt be ſhown by the way, who have their originall from the inner and fore-part of the Clavicles, and an oblique deſcent to the *Sternon* towards the griſle of the firſt rib.

For the Clavicles cannot be thus ſeparated, but that theſe muſcles muſt be violated and ſpoiled. Alſo you may divide the *Sternon* in the midſt, that you may ſhew the inward pectoral muſcles whole, having ſeparated the muſcles which ariſe from the upper part. All which things being performed as they ought, we muſt come to the coat inveſting the ribs, and then to the *Mediaſtinum*, as ariſing from it.

CHAP. VI.

Of the Pleura, *or coat inveſting the Ribs.*

What the membrane inveſting the ribs is.

THe *Tunica ſubcoſtalis*, or coat inveſting the Ribs, being the laſt of the containing parts of the Cheſt, is a large and a broad membrane anſwerable in proportion of uſe and action to the *Peritonæum* of the lower belly. For as the *Peritonæum* generally and particularly covers all the naturall parts, binding and holding them in their places, ſo this coat inveſts all the vitall parts in generall, becauſe it is ſtretched over all the inſide of the Cheſt, but in particular whilſt it gives each a coat from it ſelf.

Its originall.

It hath its original from the *perioſteum* (or as others will have it, from the *pericranium*) inveſting the *vertebra's* of the Cheſt at the roots of the ribs. Wherefore it ſticks very faſt to the ribs, ſcarce to be ſeparated, as alſo to all the parts bounding the Cheſt, and contained in it. *Veſalius* reprehends *Galen*, becauſe he ſaid, that this was double on both ſides; yet *Columbus* defends *Galen*, and verily it is ſeen to be double in the inner part of the Cheſt, under the ribs and the muſcles of the ribs, that in that ſpace there may be way for the veins, arteries, and nerves.

Whether, as there is a two-fold Pluriſie, ſo alſo a double Pleura.

Some have made it twofold, and divided it into the internal and external; as thoſe which have made two ſorts of Pluriſies, the true and baſtard; placing the external above the Ribs and intercoſtal muſcles; but the internal under the ribs, muſcles, *Diaphragma* and *Sternon*.

But we, to ſhun ambiguity, intend only to proſecute thoſe things which are manifeſt to the eys; wherefore we ſay, that the ribs are lined on the inſide with a double coat; on which immediatly and firmly ſticks to them on every ſide called the *perioſtium*, which is common to them and other bones.

The magnitude and figure.

The other which lyes upon that *perioſteum*, and on the inſide inveſts all the Ribs, whence it is called the *ſubcoſtalis tunica*. The ſubſtance, temper and compoſure are the ſame, as in other membranes. The magnitude in length, as alſo the figure, is the ſame with the compaſs of the inner part of the Cheſt; the thickneſs of it is very little. This coat is commonly called the *Pleura*, from the name of the part which it covers or lines, (for the Greeks call the ribs πλευρας.) and in like manner which happens betwixt the *perioſteum* and this *pleura*, is called either a true or baſtard Pluriſie.

CHAP. VII.

Of the Mediaſtinum.

The ſubſtance and magnitude

NOw we muſt ſpeak of the parts contained in the Cheſt, ſeeing we have already handled the containing, beginning with the *Mediaſtinum* as being a part which in diſſection firſt preſents it ſelf to our ſight. The *Mediaſtinum* is of the ſame ſubſtance, thicknes, compoſure, number, temper, as the *Pleura*. For the ſubſtance of the *Mediaſtinum* is membranous, and though it be ſtretched al the length of the Cheſt, yet it is of a ſmal thicknes, receiving veins, nerves and arteries from al the parts to which it is knit, like as the *pleura* doth; but eſpecially from the mamillary veſſels, deſcending under the *ſternon*.

It is in number one, but it is made of two membranes produced from the ſubcoſtall, for this aſcending on each ſide by the hollowneſs of the Cheſt to the *ſternon*, and then at right angles it is reflected to the bodies of the *vertebra's*, whence the *pleura* hath its originall.

In that reflection there is ſo much diſtance between each membrane, as may be ſufficient to receive two fingers. For otherwiſe, ſeeing that they cannot penetrate through the heart, it was fit each ſide of the *Pleura* ſhould turn to the *Pericardium*, that ſo they might arrive at the appointed place without offence. Neither yet is that ſpace void and empty, but woven with many ſmall nervous fibers. *Columbus* adds, that that place is often filled with a certain humor beſides nature, which you may draw out or evacuate by opening the *ſternon*.

The figure. Yet I would gladly learn of *Columbus*, by what ſigns we may know that ſuch an humor is contained there. For the figure, the *Mediaſtinum* with the *Pleura* on each ſide, repreſents the figure of a leather bottle, whoſe flat ſide is the *Mediaſtinum*, whoſe other ſide the *Pleura*; the bottom that part of the *Pleura* which is next the Midriff; the mouth the upper part of the *Pleura* at the firſt ribs. We ſhewed the ſite and connexion of the *Mediaſtinum*, when we declared its originall.

The uſe. The uſe thereof is to ſeparate the vitall parts (as it were) into two cels, the right and left, that if peradventure it happen that the one be hurt, the creature may live by the benefit of the other.

And it hath another uſe, which is to prop and hold up the *Pericardium*, that it fall not upon the heart with its weight, but toſſed with the motions of the heart and Cheſt, it may move to this or that ſide.

CHAP. VIII.

Of the Diaphragma *or Midriff.*

What the Midriff is. ALthough the Midriff may ſeem to be accounted rather a part containg than contained, yet for commodities ſake we have deferred the demonſtration thereof till now. Therefore it is a muſcle round and long, terminating the lower part of the Cheſt.

Its ſubſtance, compoſition, &c. It is of the ſame ſubſtance, compoſition and temper, as the muſcles of the *Epigaſtrium*; it is made of two coats, the lower whereof is from the *Peritoneum*, and the upper from the *Pleura*. Which getting to them fleſh, but not there, but in their circumference, by the benefit of the blood brought thither by the veins and arteries diſtributed through it, turn into a muſcle, whoſe middle is nervous and membranous, but the extremities by which it is inſerted, one while fleſhy, as in that part next to the baſtard ribs; another while tendonous, as where it touches the firſt and ſecond *vertebra's* of the loins, for it ends in them by two Tendons manifeſt enough. It is one in number, interpoſed with an oblique ſite betwixt the naturall and vitall parts.

Connexion. It hath connexion with the lower part of the *Sternon* and ſhort ribs, and the two firſt *vertebra's* of the loins, but by its coats and veſſels with the parts from whence it received them.

Quantity. The extent thereof is equal to the compaſs of the lower part of the Cheſt. The length of it is from the breſt-blade, even to the firſt and ſecond *vertebra* of the loins. The thickneſs is diverſe, for it is far thicker in its fleſhy extremity, than in its nervous originall.

Action. The Action thereof is to help the expulſion of the Excrements by the mutuall aſſiſtance of the *Epigaſtrick* muſcles, but the chief uſe is for reſpiration, of which it is one of the prime inſtruments.

Why the *Diaphragma* was called *Phrenes*. This partition the Ancients called *Phrenes*, becauſe the inflammation thereof cauſed like ſymptomes as the inflammation of the brain, by reaſon of the large nerves on each ſide one, which come to it directly and primarily from the third, fourth, and fifth *vertebra* of the neck. This muſcle differs from other muſcles, ſpecially in figure. It is perforated in three places, to give way or paſſage to the aſcendent Hollow-vein, to the artery *Aorta*, and the Gullet.

CHAP. IX.

Of the Lungs.

Their ſubſtance. Quantity. The Lobes thereof. THe Lungs are of a ſoft ſubſtance and fleſh, rare and like a ſponge, of a various colour pampered; their quantity is ſufficiently large; for moſt commonly they are divided into four lobes disjoined with a manifeſt and viſible diviſion, on each ſide two, whereby they may be the more eaſily opened and contracted, and the air may the better enter.

Beſides alſo in large bodies, who have a very great Cheſt, there is found a fifth lobe, ariſing from the ſecond lobe of the right ſide, as a cuſhion or bolſter to bear up the Hollow-vein aſcending from the Midriff to the heart.

In little men who have a ſhorter Cheſt, becauſe the heart is ſo near as to touch the *Diaphragma*, this lobe is not ſeen, yet it is always found in Dogs.

Figure. The Lungs repreſent the figure or ſhape of an Oxes foot or hoof, for like it they are thicker

thicker in their baſis, but ſlenderer in their circumference, as you may ſee in blowing them up, by the weazon, with your mouth or a pair of bellows. They are compounded of a coat coming from the *Pleura*, which on each ſide receives ſufficient number of nerves from the ſixth conjugation; and alſo of the *Vena arterioſa* coming from the right ventricle of the heart, and the *Arteria venoſa* from the left, as ſhall be ſhewed in the Anatomy of the heart; beſides the *Aſpera arteria* or weazon coming from the throat; and laſtly its own fleſh, which is nothing elſe than the concretion of cholerick blood poured out like foam about the diviſions of the foreſaid veſſels, as we have ſaid of other parts. Compoſition.

The body of the Lungs is one in number, unleſs you will divide it into two, by reaſon of the variety of its ſite, becauſe the Lobes of the Lungs ſtretched forth into the right and left ſide do almoſt involve all the heart, that ſo they may defend it againſt the hardneſs of the bones which are about it, they are tyed to the heart, chiefly at its baſis, but to the roots of the ribs, and their *vertebra's* by the coat it hath from thence; but by the veſſels to theſe parts from whence they proceed. But oft times preſently from the firſt and naturall conformation they are bound to the circumference of the ribs by certain thin membranous productions which deſcend from thence to the Lungs, otherways they are tyed to the ribs by the *Pleura*. The ſticking of the lungs to the ribs.

The nouriſhment of the Lungs is unlike to the nouriſhment of other parts of the body; for you cannot finde a part equally rare, light, and full of rare, which may be nouriſhed with blood equally thin and vaporous. In temper they incline more to heat than to cold whether you have regard to their compoſure of cholerick blood, or their uſe, which is to prepare and alter the air, that it hurt not the heart by its coldneſs. The Lungs is the inſtrument of voice and breathing by the weazon or wind-pipe. For the Lobes are the inſtruments of voice, and the ligaments, of reſpiration. But the *Larinx* or Throtle is the chief inſtrument of the voice; for the Weazon firſt prepares the voice for the Throtle, in which it being in ſome meaſure formed, is perfected in the palat of the mouth, as in the upper part of a Lute, or ſuch like inſtrument, by the help of the *Gargareon* or *uvula* as a certain quil to play withall. Their nouriſhment.

But as long as one holds his breath, he cannot ſpeak; for then the muſcles of the *Larinx*, ribs, the *Diaphragma*, and the *Epigaſtrick* muſcles are preſſed down, whence proceeds a ſuppreſſion of the vocall matter, which muſt be ſent forth, in making or uttering a voice.

Nature would have the Lungs light for many reaſons; the firſt is, That ſeeing they are of themſelves immovable, they might be more obſequious and ready to follow the motion of the Cheſt; for when it is ſtraitned, the Lungs are ſtraitned and ſubſide with it; and when it is dilated, they alſo are dilated, and ſwell ſo big that they almoſt fill up all the upper capacity thereof. Why the lungs are light.

Another cauſe is, That by this their rarity they might more eaſily admit the entring air, at ſuch times as they have much or ſodain neceſſity, as in running a race.

And laſtly, that in Pluriſies and other purulent abſceſſes of the Cheſt, the *Pus* or matter poured forth into the capacity of the Cheſt, may be ſuckt in by the rare ſubſtance of the Lungs, and by that means the ſooner ſent forth and expectorated.

The uſe of reſpiration is to cool and temper the raging heat of the heart. For it is cooled in drawing in the breath by the cool air, and in ſending out thereof by avoyding the hot fuliginous vapor. Therefore the Cheſt performs two contrary motions, for whilſt it is dilated it draws in the encompaſſing air, and when it is depreſſed, it expels the fuliginous vapor of the heart; which any one may eaſily perceive by the example of a pair of Smiths bellows. The uſe of reſpiration or breathing.

CHAP. X.

Of the Pericardium *or Purſe of the Heart.*

THE *Pericardium* is (as it were) the houſe of the Heart, which ariſing at the baſis thereof (either the ligaments of the *vertebra's* ſituate there, or elſe the veſſels of the heart yeelding it matter) is of a nervous, thick and denſe ſubſtance without any fibers. It retains the figure of the Heart, and leaves an empty ſpace for the heart to perform its proper motions. Wherefore the bigneſs of the *Pericardium* exceeds that of the heart. Whence it hath its matter?

It conſiſts of a double coat, one proper, of which we have ſpoken; another common, coming from the *Pleura*; and alſo of veins, arteries, and nerves; the veſſels partly coming from the mamillary, partly from the *Diaphragma*, chiefly there where it touches it; the nerves come on each ſide from the ſixt conjugation.

It is only one, placed about the heart, and annexed to it at the baſis thereof by its membranes, to the originall of the Lungs, and the *vertebra's* lying under them, and by the veſſels to the parts from whence it received them. It is of a cold and dry temper, as every membrane is. Number and connexion.

The uſe thereof is to cover the heart, and preſerve it in its native humidity, by a certain Uſe.

naturall moiſture contained in it, unleſs you had rather ſay that the moiſture we ſee contained in the *Pericardium*, is generated in it after death by the condenſation and concretion of the ſpirits. Although this ſeems not very likely, becauſe it grows and is heaped up in ſo great quantity in living bodies, that it hinders the motion of the heart, and cauſes ſuch palpitation or violent beating thereof, that it often ſuffocates a man.

From whence the matter of the watery humor contained in the *Pericardium*.

For this Palpitation happens alſo to hearty and ſtout men, whoſe hearts are hot, but blood thin and wateriſh, by reaſon of ſome infirmity of the ſtomach or liver; and this humor may be generated of vapors which on every ſide exhale into the *Pericardium* from the blood boiling in the ventricles of the heart, where kept in by the denſity thereof, they turn into yellowiſh moiſture, as we ſee it happens in an Alembeck.

The Conſiſtence.

Nature would have the *Pericardium* of a denſe and hard conſiſtence, that by the force thereof the heart might be kept in better ſtate; for if the *Pericardium* had bin bony, it would have made the heart like iron by the continuall attrition; on the contrary, if it had been ſoft and fungous, it would have made it ſpongy and ſoft like the lungs.

CHAP. XXX.

Of the Heart.

What the heart is, and of what ſubſtance

THe Heart, the chief manſion of the Soul, the organ of the vitall faculty, the beginning of life, the fountain of the vitall ſpirits, and ſo conſequently the continuall nouriſher of the vitall heat, the firſt living and laſt dying; which becauſe it muſt have a naturall motion of it ſelf, was made of a denſe, ſolid, and more compact ſubſtance than any other part of the body.

The three ſorts of fibers of the heart.

The fleſh thereof is woven with three ſorts of fibers, for it hath the right in the inner part deſcending from the baſis into the point, that they might dilate it, and ſo draw the blood from the Hollow vein into the receptacles thereof, and the breath or air from the lungs by the *Arteria venoſa*; it hath the tranſverſe without, which paſs through the right at right angles, to contract the Heart, and ſo drive the vitall ſpirits into the great Artery *Aorta*, and the cholerick blood to the Lungs by the *Vena arterioſa* for their nouriſhment; It hath the oblique in the midſt to contain the air and blood drawn thither by the forementioned veſſels, untill they be ſufficiently elaborate by the heart.

All theſe fibers do their parts by contracting themſelves towards their originall, as the right from the point of the heart towards the baſis, whereby it comes to paſs that by this contraction of the fibers the heart dilated becomes ſhorter, but broader, no otherwiſe than it is made more long and narrow by the contraction of the tranſverſe, but by the drawing of the oblique, it is leſſened in that part which looks towards the *vertebra's*, which chiefly appears in the point thereof.

The magnitude.

It is of an indifferent bigneſs, but yet in ſome bigger, in ſome leſs, according to the diverſe temper of cold or hot men, as we noted in the liver.

Figure.

The figure thereof is pyramidall, that is, it is broader in the baſis, and narrower at his ronnd point.

Compoſition.

It is compoſed of the moſt denſe fleſh of all the body, by the affuſion of blood at the diviſions and foldings of the veſſels, and there concrete, as it happens alſo to the other entrails. For the blood being there a little more dryed, than that which is concrete for the making of the Liver, turns into a fleſhy ſubſtance more denſe than the common fleſh, even as in hollow ulcers, when they come to a cicatrize.

The proper veſſels.

It hath the Coronall veins and arteries, which it receives either on the right ſide from the Hollow vein, or on the left from the baſis at the entrance of the artery *Aorta*. You cannot by your ey diſcern that the heart hath any other nerves than thoſe which come to it with the *Pleura*.

The Nerves.

Yet I have plainly enough obſerved others in certain beaſts which have great hearts, as ſwine; they appeared ſeated under the fat which covers the veſſels and baſis of the heart, leſt the humid ſubſtance of theſe parts ſhould be diſſolved and diſſipated by the burning heat of the heart. Whereby you may perceive that the heat of the heart is different from the Elementary heat, as that which ſuffers fat to grow about this entrail, where otherwiſe it doth not concrete unleſs by cold or a remiſs heat, which thing is chiefly worth admiration.

Number and ſite.

The Heart is one alone, ſituate moſt commonly upon the fourth *vertebra* of the Cheſt, which is in the midſt of the Cheſt. Yet ſome think that it inclines ſomewhat to the left ſide, becauſe we there feel the motion or beating thereof; but that happens by reaſon of its left ventricle, which being it is filled with many ſpirits, and the beginning of the arteries, it beats far more vehemently, than the right. It required that ſeat by the decree of Nature; becauſe that region is the moſt ſafe and armed, and beſides it is here on every ſide covered (as it were) with the hands of the Lungs.

Connexion.

It hath connexion with the fore-mentioned *Vertebra's*, but by the parts compoſing it, with thoſe parts from whence it hath them; with the Lungs by the *Vena arterioſa*,

and

and the *Arteria venoſa*; and laſtly, with all the parts of the body by the Arteries, which it ſends to them all.

It is of a hot and moiſt temper, as every fleſhy part is. The action thereof is, firſt to prepare the blood in its right ventricle, for the fit nouriſhment of the Lungs, for from hence it is that *Galen* ſaith, This right ventricle was made for the neceſſity of the Lungs. Secondly, to generate the vitall ſpirits in its left ventricle for the uſe of the whole body. But this ſpirit is nothing elſe than a certain middle ſubſtance between air and blood, fit to preſerve and carry the native heat, wherefore it is named the Vitall, as being the author and preſerver of life. In the inner parts of the heart there preſent themſelves to our conſideration the ventricles and the parts contained in the ventricles and between them; ſuch are the *Valvulæ*, or valves, the veſſels and their mouths, their diſtribution into the Lungs, the wall or partition, and the two productions or Ears of the heart; which becauſe they are doubtfull, whether they may be reckoned amongſt the externall or internall parts of the heart, I will here handle in the firſt place.

Temper and action.

What the vitall ſpirit is.

Therefore theſe *Auriculæ* or Ears are of a ſoft and nervous ſubſtance, compact of three ſorts of fibers, that ſo by their ſoftneſs they might the more eaſily follow the motions of the heart, and ſo break the violence of the matter entring the heart with great force when it is dilated. For otherwiſe by their violent and abundant entrance they might hurt the heart, and (as it were) overwhelm and ſuffocate it; but they have that capacity which we ſee given by nature, that ſo they might (as it were) keep in ſtore the blood and air, and then by little and little draw it forth for the uſe or neceſſity of the heart. But if any enquire, if ſuch matters may be drawn into the heart by the only force of the *Diaſtole*, *ad fugam vacui*, for avoyding of emptineſs; I will anſwer, That that drawing in or attraction is cauſed by the heat of the heart, which continually draws theſe matters to it, no otherwiſe than a fire draws the adjacent air, and the flame of a candle the tallow which is about the weik for nouriſhments ſake. Whilſt the heart is dilated it draws the air, whilſt it is drawn together or contracted it expels it. This motion of the heart is abſolutely naturall, as the motion of the lungs is animall. Some add a third cauſe of the attraction of the heart, to wit, the ſimilitude of the whole ſubſtance. But in my judgment, this rather takes place in that attraction which is of blood by the *venæ coronales* for the proper nouriſhment of the heart, than in that which is performed for attraction of matters for the benefit of the whole body.

The *Auriculæ Cordis*, or ears of the heart.

Theſe Ears differ in quantity, for the right is far more capacious than the left, becauſe it was made to receive a greater abundance of matter. They are two in number, on each ſide one, ſituate at the baſis of the heart: The greater at the entrance of the hollow vein into the heart, the leſs at the entrance of the veinous and of the great Artery, with which parts they both have connexion. We have formerly declared what uſe they have, that is, to break the violence of the matters, and beſides to be ſtays or props to the *Arteria venoſa* and great Artery, which could not ſuſtain ſo rapid and violent a motion as that of the Heart, by reaſon of their tenderneſs of ſubſtance.

Their magnitude and number.

Their uſe.

Of the ventricles of the Heart.

The partition between the ventricles of the heart.

THe Ventricles are in number two, on each ſide one, diſtinguiſhed with a fleſhy partition ſtrong enough, having many holes in the ſuperficies, yet no where piercing through.

Why the right ventricle is more capacious & leſs compact.

The right of theſe Ventricles is the bigger, and encompaſſed with the ſofter and rarer fleſh; the left is the leſſer, but is engirt with a threefold more denſe and compact fleſh; for the right Ventricle was made for a place to receive the blood brought by the hollow vein, and for diſtributing of it, partly by the *Vena arterioſa* into the Lungs for their nouriſhment, partly into the left Ventricle, by ſweating through the wall or partition, to yeeld matter for the generation of the vitall ſpirits.

Why the right ventricle is more capacious & leſs compact.

Therefore becauſe it was needfull there ſhould be ſo great a quantity of this blood, it was likewiſe fit that there ſhould be a place proportionable to receive that matter. And becauſe the blood which was to be received in the right ventricle was more thick, it was not ſo needfull, that the fleſh to contain it ſhould be ſo compact; but on the contrary, the arterious blood and vital ſpirit have need of a more denſe receptacle, for fear of waſting, and leſt they ſhould vaniſh into air; and alſo leſs room, that ſo the heat being united, might become the ſtronger, and more powerfully ſet upon the elaboration of the blood and ſpirits.

The action of the right ventricle.

Therefore the right Ventricle of the heart is made for the preparation of the blood appointed for the nouriſhment of the Lungs, and the generation of the vitall ſpirits, as the Lungs are made for the mitification or qualifying of the Air. Which works were neceſſary if the Phyſicall Axiome be true, *That like is nouriſhed by like*, as the rare and ſpongious Lungs with more ſubtil blood; the ſubſtance of the heart groſs and denſe, with the veinous blood as it flows from the Liver, that is groſs.

The action of the left ventricle.

And it hath its Coronall veins from the Hollow vein, that it might thence draw as much as ſhould be ſufficient.

But the left Ventricle is for the perfecting of the vitall ſpirit, and the preſervation of the native heat.

Of the Orifices and Valves of the Heart.

The uſes of the four orifices of the Heart.

THere be four Orifices of the heart, two in the right, and as many in the left ventricle; the greater of the two former gives paſſage to the vein, or the blood carried by the hollow vein to the heart; the leſſer opens a paſſage to the *vena arterioſa*, or the cholerick blood carried in it for the nouriſhment of the lungs.

The larger of the two other makes a way for the diſtribution of the Artery *Aorta*, and the vitall ſpirit through all the body; but the leſſer gives egreſs and regreſs to the *Arteria venoſa*, or to the air and fuliginous vapors. And becauſe it was convenient that the matters ſhould be admitted into their proper ventricles by theſe orifices, by the *Diaſtole*, to wit, into the right ventricle by the greater orifice, and into the left by the leſſer; and becauſe on the contrary it was fit that the matters ſhould be expelled by the *Syſtole* from their ventricles, by the fore-mentioned orifices;

The Valves.

Therefore nature to all theſe orifices hath put cleaven valves, that is to ſay, ſix in the right ventricle, that there might be three to each orifice; five in the left, that the greater orifice might have three, and the leſſer two, for the reaſon we will preſently give.

How they differ.
Action.
Site.
Figure.
Subſtance.

Theſe valves differ many ways: Firſt, in action; for ſome of them carry in matter to the heart, others hinder that which is gone out, that it come not back again. Secondly, they differ in ſite, for thoſe which bring in, have membranes without, looking in; thoſe which carry out, have them within looking out. Thirdly, in figure, for thoſe which carry in, have a pyramidall figure, but thoſe which hinder the coming back again, are made in the ſhape of the Roman letter C. Fourthly, in ſubſtance, for the former for the moſt part are fleſhy, or woven with fleſhy fibers into certain fleſhy knots ending towards the point of the heart; The latter are wholly membranous.

Number.
Motion.

Fiftly, they differ in number, for there be only five which bring in, three in the right ventricle at the greater orifice, and two in the left at the leſſer orifice; thoſe which prohibit the coming back, are ſix in each ventricle, three at each orifice. Laſtly, they differ in motion; for the fleſhy ones are opened in the *diaſtole*, for the bringing in of blood and ſpirit, and contrariwiſe are ſhut in the *ſyſtole*, that they may contain all or the greater part of that they brought in. The membranous on the contrary are opened in the *ſyſtole* to give paſſage forth to the blood and ſpirits over all the body, but ſhut in the *diaſtole*, that that which is excluded might not flow back into the Heart. But you ſhall obſerve that nature hath placed only two valves at the orifice of the *Arteria venoſa*, becauſe it was needfull that this Orifice ſhould be always open, either wholly or certainly a third part thereof; that the air might continually be drawn into the heart by this orifice in inſpiration, and ſent forth by exſpiration in the contraction of the heart. Whereby we may gather this, that there is but one third part of that air we draw into the heart in breathing, ſent forth again in the form of vapor in exſpiration, becauſe nature would have but one third part of the orifice to lye open for its paſſage out. Therefore the exſpiration or breathing out, and the *ſyſtole* of the heart and arteries, is ſhorter than the inſpiration, ſo that we may truly ſay, that the inſpiration, or drawing the breath in, is equally ſo long as the exſpiration is together with the reſt, which is in the midſt between the two motions.

Why there be only two Valves that *Arteria venoſa*.

CHAP. XII.

Of the diſtribution of the Vena arterioſa, and the Arteria venoſa.

HAving hitherto ſhewed the originall of each of the veſſels of the Heart, we muſt now ſpeak of their diſtribution. The *Vena arterioſa*, or the Arterious vein; and the *Arteria venoſa*, or the Veinous artery, each proceeding out of his proper ventricle, that is, the right and left, are divided into two large branches; one of which goes to the right and the other to the left hand, the one lying croſs-ways over the other, the vein always riding over the artery, as you may underſtand better by the ſight of your eys, than by reading of books. Theſe branches at their entrance of the lungs are divided into two other large branches, and each of them go to his peculiar Lobe of the lungs; and theſe again run almoſt into infinit other branches, diſperſed in three places over the Lungs.

The artery always lyes under the vein.

A twofold reaſon why the Vein was made arterious or like an artery.

Theſe veſſels have acquired their names by reaſon of that tranſmutation of conſiſtence, whereby the compoſure of a vein degenerates into an artery, and that of an artery into a vein, for the commodity of life. For this is a miracle of prudent Nature to change the coats of the veſſels of the lungs; producing a vein which in its body ſhould imitate an artery, and an artery which ſhould repreſent a vein: for if the *vena arterioſa* ſhould have retained its proper conſiſtence, the arterious blood which is carried by it from the heart to nouriſh the lungs, might by reaſon of its ſubtilty penetrate through, and flow away by reaſon of the rarity of the veinous texture: and ſo nature ſhould never have attained her conceived

ceived end, that is, to nouriſh the Lungs, by reaſon of the continuall motion of their contraction and dilatation.

For nouriſhment cannot be aſſimilated to the part, unleſs it be put and cleave to it. Wherefore it was fit, that nature ſhould make the body of this vein ſolid, that it might be immoveable, unſhaken and ſtubborn (in reſpect of a vein which by its ſoftneſs would have been too obſequious and yeilding to the agitation of the Lungs) that ſo it might have nouriſhment, which might be diffuſed into all parts thereof, and which might neither be drawn by its *diaſtole*, nor driven back into the heart by its *ſyſtole*. But the artery hath the conſiſtence of a vein, that by that veinous ſoftneſs according to the neceſſity of nature it might be the more readily contracted and dilated, to bring the air in and carry the vapours forth of the heart. Here we meet with a difficulty, which is, by what way the blood is carryed out of the right into the left ventricle of the heart.

Why the Artery was made like a Vein.

Galen thinks that there be certain holes in the partition made for that purpoſe; and verily there are ſuch, but they are not perforated. Wherefore *Columbus* hath found out a new way, which is, that the blood is carryed to the lungs by the *vena arterioſa*, and there attenuated; and carried from thence together with the air by the *Arteria venoſa* to the left ventricle of the heart; this he writes truly very probablely. *Eſtallus* in his treatiſe *de Catarrho* hath found out a third way, to wit, a vein, which he cals *Arteriarum nutrix*, that is, The nurſe of the arteries, which creeps a little above the Coronall to the right ear of the Heart, and then goes into the left ear thereof. But yet I am very much afraid, that this vein obſerved by *Eſtallus*, is that veſſel obſerved by *Falloppius*, whereby the *Vena arterialis* is joyned to the *Aorta*, and by which all the vitall blood is carried for the forming and nouriſhment of the lungs whilſt the infant is yet in the womb. Of which alſo *Galen* makes mention, but it had lain hid from his time to this day, but that *Falloppius* raiſed up the memory of it again.

By what way blood may paſs out of the right into the left ventricle.

The vein called the nurſe of the arteries.

Fallop. initio lib. de Arteriarum. Gal. lib. 15 de uſu part. cap. 6.

CHAP. XIII.

The diſtribution of the aſcendent Hollow vein.

THe Hollow vein riſing out of the gibbous part of the Liver, and reſembling (according to *Galen*) the body of a tree, is divided into two notable branches, but not of a like bigneſs. For the greater, by the hind part of the Liver upon the back bone & by the way, receives certain other branches from the ſubſtance of the Liver which entred not into the great trunck with the reſt. You may often ſee this deſcendent branch even to the back bone upon which it lies in this its deſcent, covered with the ſubſtance of the liver, ſo that it may ſeem that branch proceeds not from that common trunck together with the aſcendent, although indeed it alwayes doth. But the leſſer branch aſcends to the upper parts, and is diſtributed after this manner following. For firſt ariſing into the midriffe it beſtows two ſmall veins upon it, on each ſide one, which from that part are called *Phrenicæ*. But from thence when it arrives at the right Ear of the Heart, it makes the *Coronales*, the Coronall or Crown veins, which compaſs the *baſis* of the heart in manner of a Crown. Thirdly, entring ſomewhat more deeply into its right Ear, in its greater part it produces the *vena arterioſa*. Fourthly, lifted up above the heart, on the right ſide it produces the vein *Azygos* or *ſine pari* (that is, without a fellow) which deſcending to the fourth rib, (reckoning from above downwards) nouriſheth the intercoſtall muſcles and alſo the membranes of the eight lower ribs, on both ſides, ſending a branch into each of the muſcles at the lower part of the rib, which may be ſufficient for their nouriſhment. Beſides alſo oftentimes, eſpecially in little men, this vein *Azygos* nouriſhes all the ſpaces between all the ribs by the like branches, which it ſends in the ſame manner to the four upper ribs. Moreover alſo this *Azygos* ſometimes, though but ſeldome, is found double, that is, on each ſide one. Here you muſt chiefly obſerve, that this vein after it hath nouriſhed the ſpaces between the lower ribs, in its remainder deſcends under the *Diaphragma* and is joyned on the left ſide to the Emulgent vein; by which it is manifeſt how an Abſceſs may be critically evacuated by the urine, in a pluriſie. But this ſame *Azygos* is more depreſſed on the right ſide, and meets with the *Venæ lumbares*, but eſpecially with one of them, which goes down to the thigh, whereby *Falloppius* gathers that it is very convenient in the beginnings of Pluriſies to open the *vena poplitis*, the vein of the Ham. Fifthly above the *Azygos* (when it is wanting there) it ſends forth the branch called *Intercoſtalis* to the other ſpaces between the upper ribs; although this is ſometimes ſeen to come from the *Axillares*, which *Sylvius* cals the *ſubclaviæ*. Sixtly, it brings forth the *Mammariæ*, ſo called, becauſe in their greater part they run to the dugs between the fourth and fifth ribs, for the uſes formerly mentioned; men and women have on each ſide one of theſe coming from the *Subclaviæ*. They are ſometimes found to proceed by a certain common orifice from the hollow vein, before it be divided into the *Subclavian* branches, but it is rather in beaſts than in men; theſe veins deſcending by the ſides of the *ſternon* yeild nouriſhment to the two inner muſcles of the cheſt, to the ſeven intercoſtall muſcles of the true ribs, to the *ſternon* it ſelf and

Gal. lib de form. fœtus.

The greater deſcendent branch of the hollow vein.

The upper branch of the hollow vein is the leſs.

Venæ phrenicæ. Coronales.

Vena Arterioſa.

Vena Azygos, ſine pari.

This *Azygos* ſometimes two.

How the matter of a pluriſie may be evacuated by urin.

Intercoſtalis.

Mammariæ.

to

Cervicalis.

Musculosa.
In what place cupping glasses may be fitly applyed in a bastard pluriſie.

Axillaris.
Humeralis.
Jugularis interna, externa.
Into what parts the *Jugularis interna* goes.

to its ligaments and griſtles, as alſo to the *Mediaſtinum* & the upper part of the right muſcles, and the adjacent parts. Seaventhly, it produces the *Cervicalis*, which on both ſides through the holes of the produ&tions of the *Vertebra's* of the neck, aſcends to the head, ſending many ſmall branches into the ſpinall marrow through the holes by which the nerves paſs, and alſo into the membranes, ligaments, griſtles, bones, and neighbouring muſcles. Eightly, the *Muſculoſa* or muſculous, which alſo ariſing out of the *Subclavia* is divided into two other branches, the one whereof goeth upon the breſt to the paps nouriſhing the foremoſt muſcles; wherefore in a baſtard pluriſie cupping-glaſſes may be fitly applied in this place.

The other branch deſcends to the upper muſcles of the cheſt, but ſpecially to that which is called *Latiſſimus*. The tenth is the *Axillaris*. The eleventh the *Humeralis*, of which we will treat in their place. The twelfth and laſt is the *Jugularis* properly ſo called, which is twofold, the internall and externall. The internall being the leſſer doth preſently on both ſides from this very beginning aſcend by the ſides of the *Aſpera Arteria* or weazon even to the mouth and skull, yeilding nouriſhment to the parts by which it paſſes, as to the next membranes and nerves. But when it comes to the *baſis* of the *Cranium* it is divided into two branches, the greater whereof going back along the *baſis* of the *Cranium* to the hind part thereof, ſending a branch to the long muſcle ſituate upon the *œſophagus*, it enters the *Cranium* with the ſmall *Carotides* through the hole of the nerves of the ſixt conjugation, where they become one common veſſell. The leſſer ſending a ſlip to the organ of hearing by the hole called *Cæcum* (or the blind) alſo enters the *Cranium* and is ſpent in the thicker *meninx* neer to the hole of the third and fourth conjugation of nerves. The externall Jugular vein being greater and fairer, moſt commonly ſimple, yet ſometimes double, either preſently at his beginning, or a little after, aſcends ſuperficially on both ſides of the neck, between the broad muſcle, or fleſhy pannicle, being there eaſie to be diſcerned, and other muſcles ſituate at the ſides of the neck, into which as alſo into the skin it ſends certain branches for nouriſhment.

Into what parts the *Jugularis externa* goes.

The Figure of the hollow vein whole and freed from the reſt of the body.

A, The trunk of the hollow vein. The lower *AA*, At this place of the Liver, is ſeated the left part of the vein, and diſtributeth branches to the left ſide.

B. Sheweth how the trunk of the hollow vein in the cheſt (to give way to the heart) is curved or bowed to the right hand.

Betwixt A. and B. that part of the hollow vein which is betwixt the gibbous ſide of the Liver and the Midriffe.

C. The left midriffe vein called *Phrenica ſiniſtra*, from which ſurcles do run in a man unto the purſs of the heart, for the midriffe and it do grow together.

D. The orifice of the hollow vein which groweth unto the heart.

E. the crown-vein called *coronaria*, which like a crown compaſſeth the baſis of the heart, and ſprinkleth his ſurcles on the outſide thereof as far as to the cone or point.

FF. The trunk of the vein *Azygos* or *non pariil*, deſcending along the right ſide of the rack-bones unto the loins.

GG. the lower intercoſtal veins, to the branches of the vein *Azygos*, which go unto the diſtan-

ces

ces betwixt the ribs, and afford ſurcles unto the muſcles which lie upon the ribs and the rack-bones, and the membranes of the cheſt. *H.* the diviſion of the hollow vein into two ſubclavian trunks near the Iugulum under the breſt-bone. *II.* the ſubclavian branch tending on either ſide unto the arm; called by ſome *Axillaris*. *K.* the upper intercoſtall vein which commonly ſendeth three ſlips unto the diſtances of the upper ribs, unto which the firſt intercoſtall vein ſent no branches. *LL.* the deſcending mammary vein: this deſcendeth under the breſt-bone unto the right muſcles of the *Abdomen*, and affordeth ſurcles to the diſtances of the griſtles of the true ribs, to the Mediaſtinum, the muſcles that lye upon the breſt and the skin of the *Abdomen*. *M.* the conjunction of the mammary with the Epigaſtrick vein aſcending about the navill under the right muſcles. *N.* the vein of the neck called *Cervicalis*, aſcending towards the skull, which alloweth ſurcles to thoſe muſcles that lie upon the neck. *O.* the vein called *Muſcula*, which is propagated with many ſurcles into the muſcles that occupie the lower parts of the neck and the upper parts of the cheſt. *P.* *Thoracica* ſuperior, the upper cheſt vein which goeth to the muſcles lying upon the cheſt, to the skin of that place and to the dugs. *Q.* the double *Scapularis* diſtributed into the hollow part of the ſhoulderblade and the neighbour muſcles: ſo alſo betwixt *P.* and *R.* ſometimes ſmall veins do reach unto the glandules that are in the arm-holes. *R.* *Thoracica inferior* running downward along the ſides of the cheſt, and eſpecially diſtributed into the muſcle of the arm called *Latiſſimus*. *S.* the inner Jugular vein which entreth into the Scull after it hath beſtowed ſome ſurcles upon the rough artery. *T.* the externall Jugular vein. *V.* the diviſion of this vein under the root of the ear *X.* a branch of the externall Jugular which goeth into the inſide of the mouth, and is diverſly divided into the parts therein contained. *Y.* the exterior branch diſtributed near the *Fauces* into the muſcles of the chops and the hole skin of the head. *Z.* a portion of the branch. *y.* reaching unto the face. *a. a.* the vein of the fore-head. *a.* a portion of it creeping through the temples. *a.* * a propagation that goeth unto the skin of the Nowl or *Occiput*. *a. a.* the vein called *Cephalica*, or the externall vein of the arm which others call *Humeraria*. *b*, *Muſcula ſuperior*, a propagation of the *Cephalica* vein which goeth unto the backward muſcles of the neck. Betwixt *b.* and *d.* on the backſide iſſueth a branch from the *Cephalica* which paſſeth unto the outſide of the blade, and a portion thereof runneth betwixt the fleſh and the skin. *d. d.* a vein from the *Cephalica* which attaineth unto the top of the ſhoulder, and is conſumed into the muſcle that elevateth or lifteth up the arm. and into his skin. *e. e.* a ſmall vein from the *Cephalica* diſperſed through the skin and the muſcles of the arm. *f.* the diviſion of the *Cephalica* into three parts. *g.* the firſt branch runneth deep unto the muſcles which ariſe out of the externall protuberation of the arm. *h.* the ſecond branch which goeth to make the *median* vein. *i. i.* the third branch running obliquely above the wand and the outſide of the arm. *k.* from this branch certain circles are divided into the skin, the chief whereof is marked with *k. l.* the third branch at the wriſt which is joyned at *l.* with the branch of the *Baſilica* marked with *x. m.* the *Baſilica* which on the right hand is called *Hepatica*, on the left hand *Lienaris*. *n. o.* a branch of the *Baſilica* going to the heads of the muſcles of the cubit at *n.* and to the muſcles themſelves at *o. p.* a notable branch of the *Baſilica* running obliquely, and beſtowing ſurcles upon the muſcles that iſſue from the externall protuberation. This branch deſcendeth together with the fourth nerve. *q.* diviſion of the *Baſilica* into two branches and that is noted with *q.* is ever accompanied with an artery. *ſ.* a branch of this vein beſtowed upon the skin of the arm. *t.* a branch of the *Baſilica* which together with the branch of the *Cephalica* marked with *h.* makes the *mediana* or middle vein marked with *u. u.* a branch of the *Baſilica* going to the inner head of the arm, *xx.* a branch iſſuing out of the former that creepeth along unto the wriſt and toward the little finger conjoyning it ſelf with a branch of the *Cephalica*. *y.* A vein running out unto the skin at the outſide of the cubit. Upper *z.* a propagation iſſuing out of a branch of the *Baſilica* marked with *t.* lower *z.* a branch of the *Baſilica*. *x*, going to the inſide of the Arm. *«* the *Medium* or common vein. *ß*, the partition of the Median vein above the wriſt: This diviſion ſhould have been made above *»»* the Externall branch of the partition which goeth to the outſide of the head. *‹* from which iſſueth a ſmall branch to the inſide. *›* the internall branch under *›* which toward the middle and the ring finger is eſpecially diſpoſed. *fi* the vein of the thumb diſperſed into the mountenet or hillock, which is conjoyned with the branch noted with *‹ ›* the trunk of the hollow vein from which iſſue branches unto the parts ſeated under the liver. *fl* the fatty vein called *Adipoſa ſiniſtra*, which goeth unto the fat of the kidneys. *ff* the two Emulgents which lead wheyey blood unto the kidneys. *ffi* the two ſpermaticall veins leading the matter of the ſeed unto the teſticles. *V*, the beginning of the bodden veſſell called *vas varicoſum*. *ffl* the veins of the loins called *Lumbares*, which are ſent in the knots or knees to the rackbones, to the marrow of the back, to the muſcles that lie upon the loins, and to the *Peritonæum*. *‡* the biſurcation of the hollow vein into the Iliack branches, which biſurcation is not unlike. *‡* *·* *Muſcula ſuperior*, a tranſverſe branch going to the muſcles of the *Abdomen*, and to the *Peritonæum*. *··* the diviſion of the left Iliack vein, into an inner branch at *·* and an utter at *··*. *Muſcula media* the utter propagation of the branch *·* diſtributed through the muſcles of the *coxa* and the skin of the buttocks. *·* an inner propagation of the ſame

branch.

branch ♌. which goeth unto the holes of the holy bone. ♍. the vein called *Sacra*, which goeth to the upper holes of the holy bone. ♎. the vein *Hypogaſtrica* diſtributed to the bladder, to the muſcles of the fundament, and the neck of the womb. ♏. a vein ariſing from the utter branch marked with ♌. which is joyned with ſome branches of the internall vein, near the holes or perforations of the ſhare-bone. 31. a vein which when it hath paſſed the ſhare-bone diſtributeth one branch into the cup of the *coxendix* and to the muſcles of that place. ♐. another ſmall branch which runneth under the skin at the inſide of the thigh. ♑. the congreſs or meeting of the foreſaid vein, with a branch marked with char. 2. and diſtributed into the leg. ♒. the *Epigaſtrick* vein, a propagation of the utter branch ♏. perforating the *Peritonæum*, whereto as alſo the muſcles of the *Abdomen*, and the skin it offereth branches, the chief branch of this vein is joyned with the deſcending mammary above the navill at *M*. ♓. *Pudenda* an inner propagation of the branch. ♈. running overthwart unto the privities. ♉. *Saphæna* or the ancle vein or the inner branch of the crurall trunk, which creepeth through the inſide of the leg under the skin unto the tops of the toes. ♊. the firſt interior propagation of the *Saphæna* offered to the groin. ♋. the utter propagation thereof divided to the foreſide or outſide of the thigh. ♌. the ſecond propagation of the *Saphæna* going to the firſt muſcle of the leg. ♍. the third propagation of the *Saphæna* going to the skin of the whirle-bone, and unto the ham. ♎. the fourth propagation of the *Saphæna* diſperſing his muſcles forward and backward. ♏. branches from this unto the foreſide of the inward ankle, to the upper part of the foot, and to all the toes. ♐. *Iſchias minor*, called alſo *Muſcula interior* the utter branch of the crurall trunk divided into the muſcles of the *coxendix*, and to the skin of that place. 1, 2, and this alſo may be called *muſcula*. 1, the exterior and leſſer which paſſeth into ſome muſcles of the leg. 2, the interior greater and deeper unto the muſcles of the thigh. 3, 4, the vein called *Poplitea*, made of two crurall veins divided under the knee. 5, From this a ſurcle is reached upward unto the skin of the thigh. 6, but the greater part runs by the bent of the knee under the skin as far as the heel. 7, alſo to the skin of the outward ankle. 8, the vein called *Suralis* or calf vein, becauſe it runneth unto the muſcles that make the calf of the leg. 9, The diviſion of the Surall vein into an exterior trunk 9, and an interior 14. 10, 11, the diviſion of the exterior trunk under the knee into an externall branch, which along the brace attaineth unto the muſcles of the foot. 11, and an internall. 12, 13, 12, 13. which deſcending along the outſide of the leg to the upper part of the foot is cloven into divers branches, and in the back of the foot mixeth it ſelf with *Poplitea*, or the ham vein. 20. 14. the interior branch of the Surall vein which runneth into the backſide of the leg. 15, a branch hereof deſcending to the inſide of the heel and the great toe, and is divided into divers ſurcles. 17, *Iſchias major* iſſuing out of the internall trunk at 14, and running through the muſcles of the calf. 18, a propagation hereof derived unto the upper part of the foot, and affording two ſurcles to every toe. 19, the remainder of the inner trunk. 14. behind the inner ankle, approacheth to the bottom of the foot and is conſumed into all the toes. 20, the commixion of the vein *Poplitea* with the ſmall or calf-branch at 13.

Where the externall jugular vein may be fitly opened in inflammations of the parts of the mouth.

But when it arrives to the baſis of the lower part of the head, it is divided into more branches, one whereof is carried to the muſcles of the bone *Hyois*, the *Larinx*, the tongue and the lower part of the tongue (in which place it is commonly opened in the ſquinances, and other inflammations of the mouth) and to the coat of the noſe. Another is carried to the *Dura mater*, paſſing on both ſides through a hole ſituate under the bone *maſtoides*, and beſides, aſcending to the bone of the back part of the ſcull, it comes obliquely to the upper part of the future *lambdoides*, where theſe branches meeting together, paſs into the reduplication of the *Dura mater*, dividing the fore-part of the brain, that ſo joined and united, they may make the *torcular*; the third aſcendent is diſtributed upon the back-part and baſis of the lower jaw, to the lips, the ſides of the noſe, and the muſcles thereof; and in like manner to the greater corner of the eyes, to the fore-head and other parts of the face, and at length by meeting together of many branches, it makes in the forehead the vein which is called *vena rectà* or *vena frontis*, that is, the forehead vein. The fourth aſcending by the glandules behind the ears, after it hath ſent forth many branches to them, is divided into two others, one whereof paſſing before, and the other behind the ear, are at length ſpent in the skin of the head. The fifth and laſt wandring over all the lower part of the head, going to the back part thereof, makes the *vena pupis*, which extended the length of the head by the ſagitall ſuture, at length goeth ſo far, that it meets with the *vena frontis*, which meeting is the cauſe, that a vein opened in the forehead, is good in griefs of the hinder part of the head, and ſo on the contrary. But we muſt obſerve that in the *Cranium* of ſome, the *vena pupis* by one or more manifeſt paſſages ſends ſome portion thereof to the inner part of head, ſo that the *vena pupis* being opened may make revulſion of the matter which cauſeth the internall pains of the head.

Vena rectà.

Vena pupis.

CHAP.

CHAP. XIIII.

The diſtribution of the Nerves, or ſinews of the ſixth conjugation.

BEcauſe the diſtribution of the arteries cannot be well ſhewed, unleſs we [violate thoſe nerves which are carryed over the Cheſt, therefore before we ſhew the diſtribution of the arteries, we will as briefly as we can, proſecute the diſtribution of theſe nerves. Three pair of nerves of the ſixt conjugation.

Now the ſixth conjugation brings forth three pair of nerves; for paſſing out of the skul, as it comes down to the Cheſt, it by the way ſends forth ſome branches to certain muſcles of the neck, and to the three aſcendent muſcles of the *Larinx* on each ſide of the *Sternon* and upon the clavicles. Then the remainder deſcending into the Cheſt, is divided on each ſide into theſe three pair. The firſt pair makes the *Ramus coſtalis*. The ſecond, the *Ramus recurrens*. The third pair, the *Ramus ſtomachicus*. The *Ramus coſtalis*, or coſtall branch is ſo called, becauſe deſcending by the roots of the ribs, even to the holy bone, and joining themſelves to theſe which proceed from each of the *Vertebra's* of the ſpine, they are carryed to all the naturall parts. *Ramus Coſtalis.*

The *Recurrens*, or recurrent is alſo called, becauſe as it were ſtarting up from the cheſt, it runs upward again, but theſe two Recurrent nerves do not run back from the ſame place; but the right from below the artery, called by ſome the axillary, by others Subclavian, and the left from beneath the great artery, deſcending to the naturall parts. But each of them on each ſide aſcending along by the weazon, even to the *Larinx*, and then they inſinuate themſelves by the wings of *Cartilago ſcutiformis*, and *Thyroides* into the proper muſcles, which open and ſhut the *Larinx*. *Recurrens.* An anatomical *Axiome.*

By how much the nerves are nearer the originall, to wit, the brain, or ſpinall marrow, they are by ſo much the ſofter. On the contrary, by how much they are further abſent from their originall, they are ſo much the harder and ſtronger, which is the reaſon that Nature would have theſe recurrent nerves to run back again upwards, that ſo they might be the ſtronger to perform the motions of the muſcles of the *Larinx*. But the *Stomachicus* or ſtomach-branch is ſo called, becauſe it deſcends to the ſtomach or ventricle. For this branch deſcending on both ſides by the ſides of the gullet, ſends many branches from it into the inner ſubſtance of the lungs, into the coat thereof, into the *Pericardium* and heart; and then coming into the upper orifice of the ſtomach, it is ſpent in many branches, which folded after divers manners and wayes, chiefly makes that mouth or ſtomach, which is the ſeat of the Animall appetite (as they term it) and hunger, and the judger of things convenient or hurtfull for the ſtomach. But from thence they are diverſly diſſeminated over all the body of the ventricle. Why nature would have the vocall nerves recurrent. *Ramus ſtomachicus.*

Moreover the ſame branch ſends forth ſome ſmall branches to the liver and bladder of the gall, giving each part by the way, ſo much ſenſe as ſhould be ſufficiently neceſſary for it. Here you muſt note, the ſtomach branch deſcends on each ſide one, knit to the gullet, and by the way they divide themſelves into two branches, each of which goes to the oppoſite ſide, that it may there join it ſelf to the nerve of that ſide. To which purpoſe the right is carried above the gullet, the left below it, [ſo that theſe two ſtomatick become four, and again theſe four preſently become two.

CHAP. XV.

The Diviſion of the Arteries.

THe Artery ariſing forth of the left ventricle of the heart, is preſently (the two Coronall Arteries being firſt ſpred over the ſubſtance of the heart) divided into two unequall branches. The greater whereof deſcends to the lower parts, being diſtributed, as we formerly mentioned in the third book, and 22. Chapter. The leſſer aſcending to the upper parts, is again divided into two other unequal branches, the leſſer of which aſcending towards the left ſide, ſends forth no artery from it, untill it arrive at the rib of the Cheſt, where it produces the ſubclavian artery, which is diſtributed after the manner following. The left branch of the aſcendent artery is leſs then the right. The diſtribution of the left ſubclavian artery into theſe

First, it produces the intercoſtall, and by it imparts life to the three intercoſtall muſcles of the four upper ribs, and to the neighbouring places. 1 *Intercoſtalis.*

Secondly, it brings forth the Mammillary branch, which is diſtributed as the Mammillary vein is. 2 *Mammaria.*

Thirdly, the *Cervicalis*, which aſcends along the neck by the tranſverſe productions to the *Dura mater*, being diſtributed as the *Vena Cervicalis* is. 3 *Cervicalis.*

Fourthly, paſſing out of the Cheſt, from the back part of the Cheſt, it ſends forth the *muſculoſa*, whereby it gives life to the hind muſcles of the neck, even to the back part of the head. 4 *Muſculoſa.*

Fiftly,

5 *Humeraria duplex.*

Fiftly, having wholly left the Cheſt, it ſends forth the two *Humeriæ*, or ſhoulder arteries, the one whereof goes to the muſcles of the hollow part of the ſhoulder blade, the other to the joynt of the arm and the muſcles ſituate there, and the gibbous part of the ſhoulder blade.

6 *Thoracica duplex.*

Sixthly and laſtly, it produces the *Thoracica*, which alſo is twofold, for the one goes to the fore muſcles of the Cheſt, the other to the *Latiſſimus*, as we ſaid of the vein, the remnant of it makes the *Axillaris* of that ſide.

The diſtribution of the right ſubclavian artery.

The other greater branch likewiſe aſcending by the right ſide, even to the firſt rib of the Cheſt, makes alſo the ſubclavian of that ſide, which beſides thoſe diviſions it makes on this ſide, like thoſe of the left ſide, hath alſo another which makes the right and left *Carotides* or ſleepy arteries; which aſcending undivided with a nerve of the ſixth conjugation and the internall jugular vein, by the ſides of the *Aſpera Arteria* or windpipe, when they come to the *Pharinx*, they are divided on each ſide into two branches, the one internall, the other externall. The internall and greater is ſent to the *Pharinx*, *Larinx*, and tongue; then entring into the head by the long hole and the back part of the upper jaw, it ſends many branches to the noſe, eyes, the inſide of the temporal muſcles and to the *Craſſa meninx*, or *Dura mater*: the remainder of this branch going by the ſide holes of the ſame, that it might there make the *Plexus admirabilis* as we ſee. And then it is ſpent upon the baſis of the brain abundantly diffuſed over the *tenuis meninx* or *Pia mater*, & then the membrane or *Plexus Choroides*. The external or leſſer branch of the ſleepy arteries goes to the cheeks, the temples, & behind the ears; laſtly, it ſends a branch into the long muſcle of the neck, with which the internal Jugular vein inſinuates it ſelf into the *Dura mater*, entring by the hole of the nerves of the ſixth conjugation.

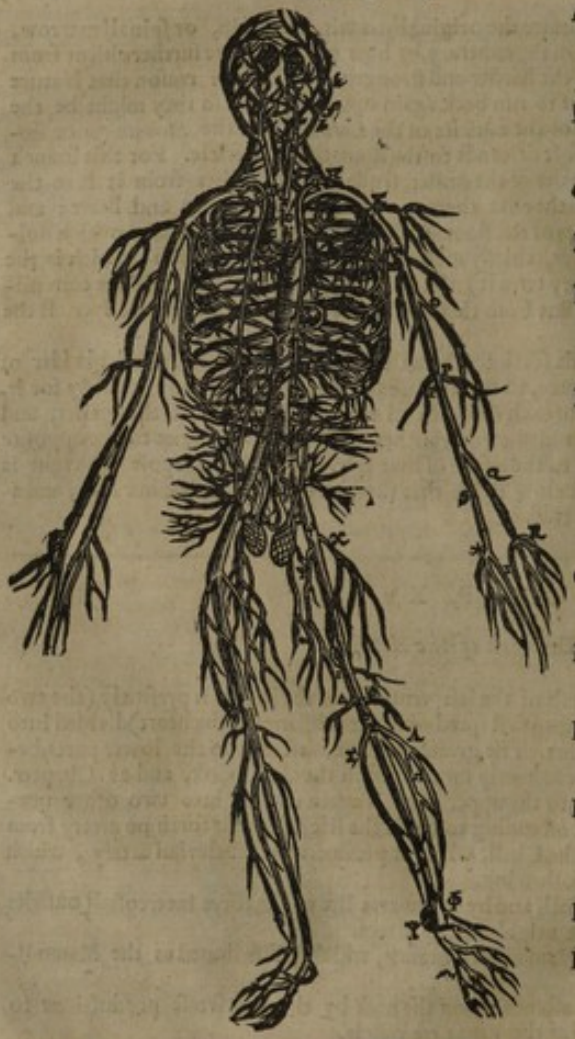
The Carotides, or ſleepy arteries.

Their diviſion.

The diſtribution of the internall branch of the ſleepy arteries.

To what parts the externall branch of the ſleepy artery arrives.

The Figure of the Arteries.



A. The orifice of the great Artery, or the beginning thereof, where it iſſueth out of the heart.

B. *Coronaria*, ſo called, becauſe like a crown it compaſſeth the baſis of the heart.

C. The diviſion of the great artery into two trunks, V. *i.*

D. The left ſubclavian climbing obliquely upward unto the ribs.

E. the upper intercoſtall artery, or a branch which beſtoweth four propagations unto the diſtances of the lower rib.

F. The neck artery which through the tranſverſe proceſſes of the rackbones of the neck, attaineth to the ſcull, beſtowing ſurcles unto the marrow and his neighbour muſcles.

G. The left Mammary artery running under the breſt-bone, and to the navill.

It diſtributeth ſurcles to the *Mediaſtinum*, the muſcles of the breſt, and of the *Abdomen*.

H. *Muſcula*, or a branch attaining to the backward muſcles of the neck.

I. The *Scapular* arteries which go unto the hollowneſs of the blade, and of the muſcles that lie thereon.

K. *Humeraria* which climbeth over the top of the ſhoulder

L. *Thoracica ſuperior*, ſprinkled unto the forward muſcles of the Cheſt. M. *Thoracica inferior*; which paſſing along the ſides of the Cheſt, attaineth to the *broad* muſcles of the arm. N. the axillarie artery running out into the arm and affording branches unto the muſcles thereof. O. A branch reaching

to

to the outſide of the cubit lying deep. PP. Branches to the joint of the cubit with the arm. Q. The upper branch of the artery running along the *Radius* and offering ſurcles to the thumb, the fore-finger, and the middle finger. *k*. A ſurcle creeping unto the outſide of the hand, and led betwixt the firſt bone of the thumb and that of the after-wriſt, ſupporteth the fore-finger where we uſe to feel the pulſe. S. the lower branch of the artery running along the *Vlna* and communicating ſurcles to the little finger, the ring finger, and the middle finger. * A little branch unto the muſcles about the little finger. T. the diſtribution of the upper and lower branches into the hand and the fingers. V. the trunk of the great artery aſcending to the *Jugulum*, and the diviſion thereof in that place into *X*, *Y*, *Z*. *X*. the left *Carotis* or ſleepy artery. *Y*. *Subclavian dextra* is divided into branches, as the right is divided. *Z*. *Carotis dextra*, called alſo *Apoplectica* and *Lithargica*. *a*. the diviſion of the left *Carotis* in the chops. *b*. the exteriour branch of that diviſion going into the face, the temples, and behind the ears. *c*. the inner branch going to the throttle, the chops, and the tongue. *d*. the diviſion hereof at the baſis of the skull, into two branches which enter the *ſinus* of the *Dura mater*. *e*. a propagation of the branch *b*. unto the muſcles of the face. *f*. the diſtribution of the branch *b*. under the root of the ear. *g*. the fore-branch hereof creeping up the temples. *h*. the back branch running on the backſide of the ear under the skin. *i*. the trunk of the great artery, deſcending unto the ſpondells of the back. *kkk*. the lower *Intercoſtall* arteries which go unto the diſtances of the eight lower ribs, from which are offered ſurcles to the marrow, and to the muſcles that grow to the back and to the Cheſt. *l*. the artery of the midriffe called *Phronica* or *Diaphragmatica*. ζ, *Meſenterica Superior*, but you muſt note that above ζ, the trunk of the *Cœliacall* artery is taken away, leſt the multitude of letters in ſo ſmall a Table ſhould breed obſcurity. ν, θ, the right and left emulgents running from the *Aorta* or great arterie unto the kidnies. ιι, κκ, the ſpermaticall arteries on either ſide going to the teſticles. λ, the lower Meſentericall artery on the left below μ, running eſpecially into the Colick gut on that ſide. μμ, the arteries called *Lumbares*, which run overthwart and like knees, affording ſurcles to the muſcles that grow to the loins, and to the *Peritonæum*. μ. the lower; *Muſcula ſuperior* running into the ſides of the *Abdomen* and the muſcles. ττ. the bifurcation of the great artery into two *iliack* trunks, and at the ſides, but ſomewhat inward are branches which make thoſe that are called *Sacræ*. T. the diviſion of the left *Iliack* trunk into an inner branch at ξ and an utter at φ. ξ. the inner *Iliack* branch. ο, *Muſcula inferior*, the utter propagation of the inner branch going unto the muſcles which cover the branch bone and the *Coxendix*. π. *Hypogaſtrica*, the inner propagation of the inner branch going to the bladder, the yard and the neck of the womb. ρ. the umbilicall artery. ς. the remainder of the branch ξ, aſſuming an addition from the utter branch neer φ, and ſo falling through the hole of the ſhare-bone into the leg. τ. *Epigaſtrica*, it aſcendeth upward unto the right muſcle of the *Abdomen*, and about the navell is joyned with the mammary artery. υ. *Pudenda*, it creepeth overthwart the ſhare-bone. φ. the *Crurall* trunk without the *Peritonæum*. χ. *Muſcula cruralis exterior*, going into the fore muſcles of the thigh. ψ. *Muſcula cruralis interior*, going unto the muſcles of the inſide of the thigh. ω. The conjunction of this artery with the branches. Γ. *Poplitea*, going to the muſcles on the backſide of the thigh. ΔΔ. which communicateth ſmall branches to the joint of the knee, and the muſcles that make the calfe of the leg. Θ. the diviſion of the *Crurall* artery under the ham into three branches. Λ. *Tibiæa exterior*, it accompanieth the brace-bone, and is conſumed into the muſcles. Ξ. the chief part of the *crurall* artery. Σ. the upper and backer *Tibiæa*. ΠΦ. the lower and backer *Tibiæa* running unto the upper ſide of the foot at Φ. Ψ. a propagation of the crurall artery going to the inner and upper ſide of the foot, and ſprinkling a branch unto the ankle. Ω. a propagation unto the lower part of the foot which affordeth ſurcles to each toe.

But we muſt note that there be more veins in a mans body, than arteries, and beſides that the veins are far thicker. For there is no need for preſerving the native heat in the parts themſelves, either of ſo many, or ſo large inſtruments of that kind. Therefore you may often find veins without arteries, but never arteries without veins.

But we underſtand that an artery is a companion to a vein, not only when it touches it, or adheres to it by common membranes, as uſually it happens; but alſo when it is appointed together with the vein for the uſe of the ſame part.

CHAP. XVI.

of the Thymus.

THe *Thymus* is a glandule, of a ſoft, rare, and ſpongious ſubſtance, of large bigneſſe, ſituate in the furtheſt and higheſt part of the Cheſt, amongſt the diviſions of the ſubclavian or Jugular veins and arteries, as yet contained in the Cheſt, for this uſe; that it might ſerve theſe veſſels for a defence againſt the bony hardneſſe of the Cheſt, and beſides, that as it were by this prop or ſtay, the diſtributions of theſe veſſels

What the *Thymus* is.

The uſe.

The magnitude.

veſſels might become the ſtronger; for ſo we ſee that nature hath provided for others, eſpecially ſuch as are the more noble and worthy. This glandule appears very large in beaſts and young men, but in ſuch as have attained to full growth it is much leſs, and ſcarce to be ſeen.

CHAP. XVII.

Of the Aſpera Arteria, *the rough Artery or Weazon.*

The Figure of the Aſpera Arteria *or Weazon.*

FIG. 1.

A. The orifice of the great artery cut from the heart.
aa. the coronall arteries of the heart.
B. C. D. the diviſion of the great artery in two trunks, the deſcending C. the aſcending D.
E. the left axillarie, or ſubclavian artery.
F. the right axillarie or ſubclavian artery.
G. the right *Carotis* or ſleepy artery.
H. the left *Carotis*.
I. the trunk of the rough artery or weazon.
K.L. The diviſion of the rough artery into two branches, of which the right goes into the right, and left into the left ſide of the lungs; which branches are again ſubdivided into many other.
M. the head of the Rough Artery called the *Larinx* or *Throttle*.
N.N. Certain Glandules or Kernells at the root of it.
OO. the right and liſt nerves of the ſixth and ſeaventh conjugation. P. A revolution of ſmall branches of the right nerve to the right *Axillary* Artery. QQ. The right Recurrent Nerve.
R. A revolution of ſmall branches of the left Nerve unto the deſcending trunk of the great Artery. SS. The left recurrent Nerve.

The ſubſtance.

THe *Aſpera Arteria* or Weazon ſeeing it is the inſtrument of voice and reſpiration, is of a griſtly, ligamentous, and wholly various ſubſtance. For if it had been one rough, and continued body with the *Larinx* or throttle, it could not be neither dilated, nor compreſſed; opened, nor ſhut, neither could it order the voice according to our deſire.

Compoſure.

It is compoſed of veins from the internall Jugular, of arteries ariſing from the *Carotides*, and of nerves proceeding from the Recurrent branch, of a double membrane, of which the externall comes from the *Peritonæum*; the internall, which is the ſtronger and woven with right fibers, from the inner coat of the mouth, the which is common with the inner coat of the *œſophagus* or gullet. And alſo it conſiſts of round griſtles, yet not drawn into a perfect circle, compoſed in manner of a channell, and mutually joyned together in order, by the ligaments that proceed from their ſides and ends.

Why the back part of the Weazon is ligamentous.

Theſe ſame ligaments perfect the remnant of the circle of this *Aſpera Arteria*, on that part next the gullet; which is thought to be done to this end; that that ſoftneſs of a ligament, might then give place, when we ſwallow harder and greater gobbets of meat. Of the two ſorts of ligaments which are annexed to the griſtles of the weazon, ſome tie and faſten together the rings or circles, which give means both to it, and theſe circles

to

to be drawn in length; otherſome bring theſe griſtles into a perfect circle, which alſo yeeld them means of dilatation. Theſe ligaments cover the inner ſuperficies, but the griſtles are placed without, to reſiſt the incurſion of externall injuries. But we muſt note, that by this communion of the inner coats of the weazon and gullet, we reap this benefit in the commodiouſneſs of the action, that one of theſe parts being depreſſed, the other is lifted up, like a rope running in a wheel or pully. For thus whilſt the gullet is depreſt to ſwallow any thing, the weazon is lifted up; and on the contrary when the ſtomach riſes up in vomiting, the weazon is depreſt. It is only one, and that ſeated between the *Larinx* (from which it takes its beginning) and the lungs in which it ends; firſt dividing it ſelf into two large branches, the right and the left, and beſides each of theſe entring into the ſubſtance of the lungs, is again divided into two others; to each of the Lobes one; and to conclude, theſe be ſubdivided into infinite others, through the ſubſtance of the Lobes.

Why the fore-part is griſtly.

The number and ſite. The diviſion of the weazon through the Lobes of the Lungs.

All theſe branches are griſtlely even to the ends. They are ſituate between the ends of the *Artera venoſa*, and the *Vena arterioſa*, that the entrance of the air into the heart by the *arteria venoſa* might be ſpeedier, as alſo the paſſage out of the vapour, by the *vena arterioſa*. Thus it hath connexion with theſe in the ends, or utmoſt parts thereof, but by the other parts compaſſing it, with the members from whence it takes them. The temperament thereof is cold and dry. The action is to carry the air to, and vapours from the lungs; that by dilating, but this by preſſing the griſtles together.

The temper and action.

CHAP. XVIII.

Of the Gullet.

THe *OEſophagus*, or Gullet, which is the paſſage of the meat and drink, is of a middle ſubſtance between the fleſh and ſinews, becauſe it conſiſts of one nervous membrane and another fleſhy. The nervous is placed the innermoſt, and is continued to the inner coat of the mouth even to the Lips, (whereby it comes to paſs,) that the Lips tremble in diſeaſes which are ready to be judged by a criticall vomiting, and to the inner part of the *Aſpera Arteria*; it conſiſts of right Fibers for the attraction of the meat, which we ſee is ſometimes ſo quick and forcible in hungry people, that they have ſcarce time to chaw it, before they find it, to be pluckt down, as it were with a hand. The fleſhy Coat placed without is woven with tranſverſe fibers, to haſten the going of the meat into the ſtomach, and for expulſion in vomiting and breaking of wind. Theſe two coats are continued with the two coats of the ſtomach, and have the like ſite. Beſides, the Gullet hath theſe parts compoſing it, as a vein from the Gate and Hollow aſcendent vein; a nerve from the ſixt conjugation, an Artery from that which creeps alongſt the bottome of the ſtomach with the *vena Gaſtrica*, or elſe from the Arteries aſcending the hollow part thereof; but alſo beſides all theſe veſſels it may have a third coat from the membrane inveſting the Ribs, or *Pleura*. The magnitude of the Gullet is large enough, yet ſome be bigger, ſome leſs, according to the variety of bodies. The figure of it is round, that ſo it might be more large to ſwallow meat, and leſs ſubject to offence. It is placed between the back bone and weazon from the roots of the tongue even to the ſtomach. But as it deſcends alongſt the back bone, when it comes to the fourth *Vertebra* of the Cheſt, it turns to the right ſide, to give way to the great Artery *Aorta* and the deſcendent Artery, then it turns to the left ſide to the ſtomach, or mouth of the ventricle. Nature hath faſtened it to the *Diaphragma* with ſtrong membranous ties, leſt that if it had lain upon the Artery it ſhould have hindred the paſſage of the vitall ſpirit to the lower parts. It is only one and that tyed to the forementioned parts, both by its veſſels and membranes. It is of temper rather cold than hot, as all thoſe parts, which are more nervous than fleſhy, are. The Action thereof is to draw and carry down the meat, and to caſt forth ſuch things by vomit as trouble the ſtomach. Here you muſt note, that whilſt we ſwallow down, the Gullet is drawn downwards, and the weazon upwards, which is the cauſe that we cannot ſup and blow, ſwallow and breath together at the ſame inſtant; which we muſt think to happen by Gods ſingular providence; to whoſe name be glory for everlaſting, Amen.

The ſubſtance.

Attractive force thereof.

The compoſure.

The magnitude. The Figure, Site.

Temper and action. Why we cannot ſup and blow at one time.

The End of the fourth Book.

The Fifth Book,

Of the Animall parts contained in the HEAD.

CHAP. I.

A Generall deſcription of the Head.

HAving hitherto declared two generall parts of mans body, that is, the Naturall and Vital, it is now fit to betake our ſelves to the laſt, that is, the Animall, beginning with the Head.

Wherefore we will firſt define the head, then divide it into its parts; thirdly, deſcribe each of theſe parts; fourthly, demonſtrate them after the order they offer themſelves to our ſight in diſſection.

What the head is. Why ſeated in the higheſt place.

The head therefore is the ſeat of the ſenſes, the Palace and habitation of reaſon and wiſdome, from whence as from a fountain infinite actions and commodities ariſe. It is ſeated above the reſt of the body, that the Animall ſpirit from thence, as from a tower, may govern and moderate the whole body, and perform all actions according to the præſcript of nature. By the head we underſtand all that which is contained from the Crown of the head to the firſt *vertebra* of the neck.

The figure.

The beſt figure of the head is round, lightly flatted on each ſide, *extuberating* ſomething to the fore and hind part thereof. For from hence is taken an argument of the goodneſs of the ſenſes; on the contrary, thoſe which are exactly round, or acuminate, and ſharp towards the top, are not thought good. The head is divided into the face, forehead, temples, the forepart, the crown and hind part.

The diviſion thereof.

By the face we underſtand, whatſoever is contained between the Eye-brows and the lower part of the chin. By the forehead, all the ſpace from the eye-brows even to the Coronall Suture. By the temples, whatſoever is hollowed from the leſſer corner of the eye, even to the ears. By the forepart of the head, whatſoever runs in length from the top of the forehead, or the Coronall Suture, even to the Suture *Lambdoides*, and on each ſide to the *Oſſa petroſa*, the ſtony bones, or ſcaly Sutures. By the Crown we ſignifie a certain point exquiſitely in the midſt of the Sagittall Suture, which is ſufficiently known. By the *Occiput* or hind part of the head, that which is terminated by the Suture *lambdoides*, and the firſt *vertebra* of the neck.

The containing parts of the head.

Of all theſe parts there be ſome ſimple, ſome compound, beſides ſome are containing, ſome contained. Of the containing ſome are common to all the parts of the head, as the skin, the fleſhy pannicle and *pericranium*; others are proper to certain parts, as the fleſhy pannicle to the neck, face, forehead, and skin covering the *Cranium*, the common coat of the muſcles to the fat and face; the skull and both the *Meninges* to the brain.

The parts contained.

The parts contained are the ſubſtance of the brain, the four ventricles, and the bodies contained in them, the nerves, the mamillary proceſſes; the *Plexus Choroides* or *Rete Admirabile*, the *Glandula Baſilaris*, and others of which we will ſpeak hereafter.

We muſt now ſpeak of the containing parts beginning with the skin; for the order of teaching requires that we take our *Exordium* from the more ſimple, but firſt we will ſay ſomething of the hair.

What the hair is. The uſe thereof.

The hair is nothing elſe than an excrement generated and formed of the more groſs and terrene portion of the ſuperfluities of the third concoction, which could not be waſted by inſenſible tranſpiration. The benefit of it is, that conſuming the groſs and fuliginous or ſooty excrements of the brain it becomes a cover and ornament for the head.

This hair of the head and eye-browes have their originall from the firſt conformation of the infant in the womb, the reſt of the hairs of the body ariſe and grow forth as the body grows and becomes more dry, of which ſort are the hairs which cover the chin, armholes, groins, and other parts of our bodies.

CHAP.

CHAP. II.

Of the muſculous skin of the Head, (commonly called the hairy ſcalpe) and of the Pericranium.

THe skin which covers the skull, and is covered with the hair, is far more fleſhy, thick, hard and dry than any other part of the body, eſpecially which wants hair. The skin hath almoſt the like condition of quality as thoſe parts have, which it doth ſimply cover, but is as it were loſt in them, or grown into one with them, as in the lips and forehead with the fleſhy pannicle, wherefore it is there called muſculous; in other places it adheres to the griſtles, as on the ſides of the noſtrills and corners of the Eyes, whereupon it is there called griſtely.

What the hairy ſcalp is.

It hath connexion with the *Pericranium*, becauſe joyned to it, it receives nerves from the firſt and ſecond *Vertebra* of the neck, and from the third conjugation of the brain which are diſſeminated through all its ſubſtance, whereby it comes to paſs, that the wounds, contuſions, and impoſthumes, that happen in or upon this skin, are not to be neglected.

Its connexion

The * *Pericranium*, (but I ſuppoſe it ſhould be the *Perioſteum*) is a moſt thin membrane, which next and immediately covers all the bones of the body, and this on the head is called by a peculiar name the *Pericranium* by reaſon of the excellency of the *Cranium* or skull, in other bones it is tearmed the *Perioſtium*: And as the *Pericranium* takes its originall from the *Craſſa meninx* propagating it ſelf by certain ſtrings or threds ſent forth by the ſutures and holes of the skull, ſo all other membranes of the body have their originall either from this *Pericranium*, or *Craſſa meninx*, ſending forth their productions, as well by the holes or paſſages of the head, as by theſe of the ſpinall marrow or back bone it ſelf, even to the Holy bone.

* Our Author with *Fallopius* and *Laurentius* confounds the *pericranium* and *perioſteum*: but *Veſalius Bauhinus* and *Bartholinus* diſtinguiſh them making the *pericranium* thin and ſoft, and the *perioſteum* moſt thin and nervous, and of moſt exquiſite ſenſe.

Why the wounds thereof muſt not be neglected.

Of which this is an argument, for in what part ſoever of the body a membrane is hurt, preſently the hurt or ſenſe thereof comes to the *Craſſa meninx*. For ſo thoſe who have but their little Toe hurt when they ſneeſe, or cough, perceive an increaſe of their pain, by the paſſage thereof to the brain.

The *Pericranium* and *perioſteum* of the ſame nature.

The uſe of this *Pericranium* is to cover the skull; and to give notice of things hurtfull, by the power of the quick ſenſe which it is endued withall, and the *Pereoſtium* doth the like in other bones. Beſides it ſuſtaines and faſtens by the ſutures the *Craſſa meninx* to the skul; leſt it ſhould fall by reaſon of its weight upon the *Pia mater*, and ſo hurt it, and hinder the pulſation of the brain and arteries that are plenteouſly ſpread through both the *Meninges*. Wherefore the *Pericranium* hath moſt ſtrait connexion with the *Craſſa meninx*, becauſe it takes the originall from thence.

Whence all the membranes proceed.

We muſt think the ſame of the other membranes of the body, which thing is very notable in the ſolution of the continuity of the membranes.

Why when any membranous part is hurt in any part of the body, the head is affected be conſent.

The uſe of the *Pericranium*.

CHAP. III.

Of the Sutures.

THe Sutures do ſew or faſten together the bones of the skull; theſe be five in number. Three are true and legitimate, two falſe and ſpurious. The Coronall, the firſt of the true Sutures, is ſeated in the forepart of the head, deſcending downwards overthwart the forepart of the head to the midſt of the temples; it is ſo called, becauſe *Corolle*, that is, wreaths, crowns, or garlands, are ſet upon that place.

Their uſe and number.

The ſecond is called the *Sagittalis*, or right ſuture, as that which running through the crown divides the head into two equall parts, as with a ſtraight line, running the length of it from the Coronall to the *Lambdoides* or hind Suture.

But this third Suture *Lambdoides*, is ſo called becauſe it repreſents this Capitall greek letter Lambda Λ. You muſt underſtand this deſcription of the Sutures, not as alwayes but as for the greater part to be thus. For there be ſome skulls that want the foremoſt Suture, otherſome the hind, and ſometimes ſuch as have none of the true Sutures, but only the falſe and ſpurious. But alſo you ſhall ſometimes find the Sagittal to run to the noſe.

Some skulls want Sutures.

And oft times there be three or four Sutures in the back part of the head, ſo that indeed the number of the Sutures is not certain. Which alſo we find obſerved by *Cornelius Celſus*, where he writes, that *Hippocrates* was deceived by the Sutures by chance, for that he conjectured that the bones of the back part of the head, were broken, becauſe his Probe thruſt to the roughnes of the ſecond ſuture *Lambdoides*, ſtaied as at a cleft made in the bone by a ſtroak.

Celſ. lib. 8, Cap. 10.

The other two are called the falſe, ſtony and ſcaly Sutures, by reaſon they are made by a ſcaly conjunction of the bones, but not by a toothed ſaw or comb-like connexion. But if any ask, why the head conſiſts not of one bone, that ſo it might be the ſtronger: I anſwer it

Why the ſcull conſiſts of divers bones.

it is, that ſo it might be the ſafer both from internall and externall injuries. For the skull being as it were the tunnel of the chimney of this humane fabrick, to which all the ſmoky vapours of the whole body aſcend, if it had been compoſed of one bone, theſe vapours ſhould have had no paſſage forth.

In what bodies and by what means the vena *pupis* ſometimes enters into the parts within the ſcull.

Wherefore the groſſer vapours paſs away by the Sutures, but the more ſubtile by the pores of the skull; ſome have their Sutures very open, but others on the contrary very cloſe.

Therefore nature hath otherwiſe compendiouſly provided for ſuch as want Sutures; For it hath made one or two holes, ſome two fingers bredth from the *Lambdoides*, through which the *Vena pupis* enters into the skul, and they are of that largeneſs that you may put a points tag into them, that ſo the vapours may have free paſſage forth, otherwiſe there would be danger of death; thus nature hath been carefull to provide for man againſt internall injuries; and in like manner againſt externall, for it hath made the head to conſiſt of divers bones, that when one bone is broken the other may be ſafe, the violence of the ſtroak being ſtayed in the diviſion of the bones.

In what men one part of the being head ſtricken, the oppoſite is broken.

Whereby you may know, that if the skull chance to be broken in the oppoſite ſide to that which received the blow, that it happens either by reaſon of the defect of ſutures, or elſe becauſe they are unperfect, & too firmly cloſed; otherwiſe it is unpoſſible ſuch fractures ſhould happen by reaſon of the ſeparation of the bones, which breaks the violence of the blow that it can go no further.

Why we muſt not apply a Trepan to the Sutures.

And certainly, as it is rare to find a skull without Sutures, ſo it is rare to find ſuch kind of fractures. Therefore Chirurgeons muſt diligently obſerve the Sutures and ſite of them, leſt they be deceived and take them for fractures, or unawares apply a Trepan to them, whence by breaking the veins, arteries and nervous fibers by which the internall parts communicate with the externall, there may enſue increaſe of pain, a violent defluxion of blood upon the *Craſſa meninx*, and the falling thereof upon the brain, (the fibers being broken by which it ſtuck to the *Pericranium*) and ſo conſequently a deadly interception of the pulſion of the Brain.

CHAP. IIII.

Of the Cranium, *or Skull.*

What the *Cranium* or skul is.

THe *Cranium*, or Skull covering the brain like an Helmet, is compoſed and conſiſts of ſeaven bones, of which ſome are more denſe, thick and hard than other ſome. The firſt is the *Os occipitis*, or Nowl bone ſeated in the back part of the head, more hard and thick than the reſt, becauſe we want hands and eyes behind, whereby we may keep or ſave our ſelves from falling.

Why the nowl bone is harder than the reſt.

This bone is circumſcribed, or bounded by the future *Lambdoides*, and the * *Os baſilare*. The eminencies and as it were heads of this bone are received into the firſt *Vertebra*; for upon this the head is turned forwards and backwards, by the force of fourteen muſcles and ſtrong ligaments, which firmly tye theſe heads of the Nowl bone in the cavities of this firſt *vertebra*.

* My Author means by the *Os Baſilare* in this place the wedg bone: but ſome Anatomiſts make it a Synonyma of this *Os occipitis*.

The ſecond bone of the skull is in the forepart, and is called the *Os coronale* or *Os frontis* the forehead bone, it hath the ſecond place in ſtrength and thickneſs. It is bounded by the Coronall future, and the ends of the wedgbone: in this forehead bone there is often found a great cavity under the upper part of the eyebrows, filled with a glutinous, groſs, viſcid and white matter or ſubſtance, which is thought to help to elaborate the air for the ſenſe of ſmelling.

The forehead bone, next to the nowl bone is harder than the reſt.

A Cavity to be obſerved in the forehead bone.

Chirurgeons muſt take ſpecial notice of this cavity, becauſe when the head chances to be broken in that place, it may happen, that the fracture exceeds not the firſt table; wherefore being ignorant of this cavity, and moved with a falſe perſwaſion that they ſee the brain, they may think the bone wholly broken, and to preſs the *Meninges*, whereupon they will dilate the womb, and apply a Trepan and other inſtruments to lift up the ſecond table of the bone, without any need at all, and with the manifeſt danger of the life of the patient.

Oſſa parietalia & Bregmatis.

The third and fourth bones of the skull are the *Oſſa parietalia*, or *Bregmatis*, having the third place of denſity and thickneſs; although this denſity and thickneſs be different in divers places of them. For on the upper part of the head, or crown, (where that ſubſtance turns not to a bone in children untill they have all their teeth, ſo that it feels ſoft in touching, & through it you may feel the beating of the brain) theſe bones are very tender, ſo that oft times, they are no thicker than ones nail, that ſo the moiſt and vaporous excrements of the brain, ſhut up where the greater portion of the brain reſides, may have a freer paſſage by the Brains *diaſtole* and *ſyſtole*. Theſe two ſquare bones are bounded above with the Sagittall future, below with the ſcaly, on the forepart with the coronall, and on the hind part with the *Lambdoides*.

Oſſa petroſa, or the ſcaly bones.

The fifth and ſixth bone of the skull are the two *Oſſa petroſa* ſtony or ſcaly bones, which

are

are next to the former in ſtrength. They are bounded with the falſe or baſtard Suture, and with part of the *Lambdoides*, and wedgbone.

The ſeventh is the *Os ſphenoides*, *baſilare*, or *Cuneiforme*, that is, the wedgbone. It is called *Baſilare*, becauſe it is (as it were) the baſis of the head. To this the reſt of the bones of the head are fitly faſtned in their places. This bone is bounded on each ſide with the bones of the forehead, the ſtony bones, and bones of the Nowl and Palat. The figure repreſents a Bat, and its proceſſes her wings. *Os ſphenoides*, or the wedg-bone.

There is beſides theſe another bone at the baſis of the forehead bone, into which the mamillary proceſſes end, the Greeks call it ἐθμοειδὲς, the Latins *Cribroſum* and *Spongioſum*, the ſpongy bone, becauſe it hath many holes in it not perforated in a direct paſſage, as in a ſive, but winding and anfractuous, that the air ſhould not by the force of attraction, preſently leap or aſcend into the brain, and affect it with its qualities, before it be elaborated by its lingring in the way. There are beſides alſo, ſix other little bones lying hid in the ſtony bones at the hole or auditory paſſage; on each ſide three, that is to ſay, the *Incus* or Anvill, the *Malleolus* or Hammer, and the *Stapes* or ſtirrop, becauſe in their figure they repreſent theſe three things; the uſe of theſe we will declare hereafter. *Os Ethmoides*, or *cribroſum*. The three bones of the auditory paſſage.

But alſo in ſome skuls there are found ſome diviſions of bones, as it were collected fragments, to the bigneſs almoſt of ones thumb, furniſhed and diſtinguiſhed by their proper commiſſures, or ſutures, which thing is very fit to be known to a Chirurgeon in the uſe of a Trepan.

Verily he may give a conjecture hereof, whilſt he ſeparates the *pericranium* from the ſkul, for the *pericranium* is with greater difficulty pluckt away from the ſutures, becauſe the *Craſſa meninx* hath ſtraiter connexion therewith by his nervous fibers ſent forth in ſuch places. The skuls in women are ſofter and thinner than in men, and in children more than in women, and in young men more then in men of a middle age. Alſo the Æthiopians or Blackmoors, as alſo all the people inhabiting to the South, have their skuls more hard and compoſed with fewer ſutures. By what means a Chirurgeon may conjecture that there are extraordinary Sutures in certain places of the skull. The skuls of ſuch as inhabit the Southern countreys, are more hard and denſe.

Therefore as it is written by *Hippocrates*, ſuch as have their Skuls the ſofter, the ſymptomes in fractures are more dangerous and to be feared in them. But the Skull by how much the ſofter it is, by ſo much it more eaſily and readily yeelds to the perforating Trepan. Moreover in ſome skuls, there be bunches ſtanding out beſides nature, made either round or cornered, which the Chirurgeon muſt obſerve for two cauſes; the firſt is for the better conſideration of a blow or fracture. For in theſe bunches or knots, the ſolution of the continuity cannot be, if it ſeem to be ſtretched in length, but that the wound muſt penetrate to the inner parts. For in a round body there can be no long wound, but it muſt be deep, by the weapon forced the deeper, becauſe as a round body touches a plain but only *in puncto* in a prick or point: ſo whatſoever fals only lightly or ſuperficially upon it, only touches a point thereof. But on the contrary, a long wound muſt be upon a plain ſurface, which may be but only ſuperficiall. We muſt obſerve the extuberancies beſides nature, which are in ſome skuls.

Another cauſe is, becauſe ſuch bunches change the figure and ſite of the Sutures. And the Chirurgeon muſt note that the skull hath two tables, in the midſt whereof the *Diploe* is; which is a ſpongy ſubſtance into which many veins and arteries, and a certain fleſhineſs are inſerted, that the skull ſhould not be ſo heavie, and that it might have within it ſelf proviſion for the life thereof; and laſtly that there might be freer paſſage out for the ſuliginous vapors of the brain. The ſite and ſubſtance of the *Diploe*.

The upper table is thicker, denſer, ſtronger and ſmoother than the lower. For this as it is the ſlenderer, ſo it is the more unequal, that it may give place to the internall veins and arteries, (which make a manifeſt impreſſion into the ſecond table on the inſide thereof) from which branches enter into the skull by the holes which contain the eys. Which thing faſtens the *Craſſa meninx* to the skull, and is therefore very worthy to be obſerved.

For in great contuſions when no fracture or fiſſure appears in the skull by reaſon of the great concuſſion or ſhaking of the brain, theſe veſſels are often broken, whence happens a flux of blood between the skull and membranes, and laſtly death. But it is fit the Chirurgeon take good heed to the tender and ſoft ſubſtance of the *Diploe*, that when he comes to it, having paſſed the firſt table, he may carefully uſe his Trepan, leſt by leaning too hard, it run in too violently, and hurt the membranes lying underneath it, whence convulſion and death would follow. To which danger I have found a remedy, by the happy invention of a Trepan, as I wil hereafter more at large declare in handling the wounds of the head. There may be a deadly rupture of the veſſels of the brain without any fracture of the skull. Caution to be had in the uſe of the Trepan.

CHAP.

CHAP. V.

Of the Meninges, that is, the two membranes called Dura Mater *and* Pia Mater.

Why the bone *Ethmoides* is perforated.

THe *Craſſa meninx* is one of the firſt and principall membranes of the body; it goes forth by the ſutures and the holes of the nerves that proceed out of the skull; and it paſſes forth by the bone *Ethmoides* perforated for that purpoſe, to carry ſmels to the brain, and purge it of excrementitious humors. This ſame *Craſſa meninx* inveſts the inner coat of the Noſe; alſo it paſſes forth of the great hole through which the ſpinall marrow paſſes, veſted with this *Craſſa meninx*, with all the nerves and membranes. For which cauſe if any membrane in the whole body be hurt, by reaſon of that continuation which it hath with the *Meninges*, it ſtraight communicates the hurt to the head by conſent.

The conſiſtence of the *Craſſa meninx*. The uſe.

The *Craſſa meninx* is thicker and harder than all other membranes in the body; whereupon it hath got the name of the *Dura mater*, beſides alſo it begirts, produces, and defends the other membranes.

The uſe of it is to involve all the brain, and to keep it when it is dilated, that it be not hurt by the hardneſs of the skull. For the courſe of nature is ſuch, that it always places ſome third thing of a middle nature, betwixt two contraries. Alſo the *Craſſa meninx* yeelds another commodity, which is, that it carries the veins and arteries entring the skull for a long ſpace. For they inſinuate themſelves into that part, where the duplicated or folded *Meninges* ſeparate the brain from the *Cerebellum*, and ſo from thence they are led by the ſides of the *Cerebellum*, untill they come (as it were) to the top thereof; where being united, they inſinuate themſelves into that other part of the *Craſſa meninx*, where in like manner being duplicated and doubled, it parts the brain at the top into the right and left. Theſe united veins run in a direct paſſage even to the forehead, after the manner of the Sagittall ſuture; They have called this paſſage of the mutually infolded veins, the *Torcular* or Preſs, becauſe the blood which nouriſhes the brain is preſſed and drops from thence by the infinite mouths of theſe ſmall veins. Therefore alſo here is another uſe of the *Craſſa meninx*, to diſtinguiſh the brain by its duplication, being it thruſts it ſelf deep into its body, into two parts, the fore and hind, and preſently to ſeparate the ſame into the right and left; that one part being hurt, the other may remain ſafe and ſound, performing it sduty to the creature, as we ſee in ſome that have the Palſey. *Columbus* obſerved that this *Meninx* was double, and verily I have found it true by my own ſight.

What the *Torcular* is.

One part of the brain being hurt the other keeps the creature alive.

The conſiſtence of the *Pia mater*.

The other *Meninx* or membrane of the brain, called *Pia mater*, is moſt ſlender interlaced with divers veins and arteries, for its own and the brains nouriſhment and life. This doth not only involve the brain, as the *Craſſa meninx* doth, but alſo more deeply penetrates into the anfractuous paſſages thereof, that it may every where joyn and bind it to it ſelf, not eaſily to be drawn from thence, by many ſmall fibers whereby it deſcends even to the cavities of the ventricles thereof. Wherefore you muſt ſee it abſolutely in the ſite as we have mentioned, and not pluck it away unleſs with the ſubſtance of the Brain.

The ſenſe of the *Meninges*.

Theſe membranes when they are hurt or affliſted, cauſe grievous and moſt bitter torment and pain; wherefore I dare ſay, that theſe membranes are rather the authors of ſenſe, than the brain it ſelf, becauſe in diſeaſes of the Brain, as in the Lethargy, the party affected is troubled with little or no ſenſe of pain.

CHAP. VI.

Of the Brain.

What the brain is.

NOw followeth the Brain, the beginning of the nerves and voluntary motion, the inſtrument of the firſt and principall faculty of the Soul, that is, the Animall and Rationall. Man hath this part in greater plenty then any other Creature, for it almoſt fils the whole skull. But if it ſhould have filled it all, the Brain could not be moved, that is, dilated and contracted in the skull. It

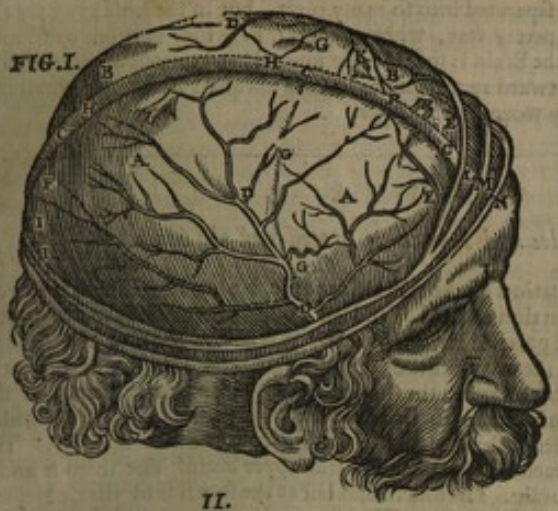
The quantity.

Temper.

is of a cold and moiſt Temperature. The laudable temper of the Brain is known by the integrity and perfection of the internall and externall ſenſes, the indifferency of ſleep and waking, the maturity or ripeneſs of judgment, and conſtancy of opinions, from which, unleſs it meet with better and more probable, it is not eaſie to be moved.

The first figure of the Head, as it appears when the skull is taken away.
The second figure shewing the Brain, the skull and Dura mater *being taken off.*

FIG. I.



II.

AA, BB. The *Dura meninx* or thick membrane.
CCC. The third *Sinus* of this membrane.
DD. The course of the veins as they run through the membrane or the second vein of the brain.
EE. The first vein of the brain.
FFF. Certain small veins which perforate the skull and reach to the *pericranium* or skull-skin.
GGG. Fibers of the *Dura meninx* passing through the Coronall Suture, which fibers make the *Pericranium.*
HH. fibers passing through the sagittall Suture.
II. Others passing through the Lambdall Suture.
K. A knub which useth to grow to the *Sinus* of the Skull.
L. A cavity in the fore-head bone.
M. The skull.
N. The *Pericranium* or skull-skin.

Fig. 2.

AAA. A part of the *Crasse meninx* dividing the brain. *BB.* the third *Sinus* of the same *Crasse* membrane opened.
CC. the beginning of the vessels out of the third *Sinus* into the *Pia mater.*
DDD. the propagation or branches of these vessels. *EEE.* the *Pia mater* or thin *meninx* immediately compassing the brain. *FFF.* Certain vessels running through the convolutions or branches of the brain. *GGG.* Certain branches of veins running through the sides of the *dura meninx. HHH.* The thick membrane reflected downward.

You shall know the brain is more hot, by the quickness of the senses and motions of the body, by shortness of sleep, the suddain conceiving of opinions and change of them, by the slippery and failing memory, and lastly, by easily receiving hurt from hot things, as the Sun and Fire. Such as have a cold brain, are slow to learning, and to conceive other things, but they do not easily put away their once conceived opinions. They have slow motion to action, and are sleepy. Those who have a dry brain, are also slow to learn; for you shall not easily imprint any thing in dry bodies, but they are most constant retainers of those things they have once learned; also the motions of their bodies are quick and nimble. Those who have a moist brain do easily learn, but have an il memory, for with like facility as they admit the speices of things and imprint them in their minds, do they suffer them to slide and slip out of it again. So clay doth easily admit what Character or impression soever you will, but the parts of this clay which easily gave way to this impression, going together again, mixes, obliterates and confounds the same. Therefore the senses proceeding from a cold brain are dull, the motions slow, the sleep profound.

The action of the brain is to elaborate the Animall Spirit and necessary sense serving the whole body, and to subject it self as an instrument to the principall faculties, as to reason. The brain is twofold, the fore and hind. The hind by reason of its smallness is call

The Action.

Number.

called the *Cerebellum*, (the little or After-brain). But the fore by reaſon of its magnitude hath retained the abſolute name of the brain. Again this fore-brain is twofold, the right and left, parted by that depreſſion, which we formerly mentioned, of the *Meninges* into the body of the brain. But this diviſion is not to be here ſo abſolutely taken, as though the Brain were exactly divided and ſeparated into ſo many parts, but in the ſenſe as we ſay the Liver and Lungs are divided a pretty way, whereas at their Baſis they have one continued body. The outward ſurface of the Brain is ſoft, but the inward hard, callous & very ſmooth; when on the contrary, the outward appears indented and unequall with many windings, and creſted as it were with many wormlike foldings.

CHAP. VII.

Of the Ventricles and Mamillary proceſſes of the Brain.

The ſubſtance of the brain is porous and ſweats forth blood.

FOr the eaſie demonſtration of the ventricles of the brain, it is convenient you cut away a large portion thereof, and in your cutting obſerve the blood ſweating out of the pores of it. But beſides, it is fit you conſider the ſpongy ſubſtance by which the excrements of the brain are heaped up, to be preſently ſtrained out, and ſent away by the hollow paſſage. In the ſubſtance of the brain you muſt obſerve four ventricles, mutually conjoyned by certain paſſages, by which the ſpirits endued with the *ſpecies* of things ſenſible may go from one into another. The firſt and two greater, one on each ſide are placed in the upper brain. The third is under them in the middle part of the brain. The fourth and laſt at the fore ſide of the *Cerebellum*, towards the beginning of the ſpinall marrow. The two formoſt are extended the length way of the brain in the form of a ſemicircle, whoſe horns look or bend outwards. They are ſpacious and large, becauſe it was meet the Spirits contained there together with their excrements, ſhould be there purified and cleanſed; but in other ventricles, the pure and already elaborate ſpirits are only received. Theſe ventricles are white and ſmooth in their inner ſuperficies; but that on each ſide they have an extuberancy at the midſt of the ſemicircle, ſituate at the baſis of the Pillar of the middle ventricle towards the noſe under the *Septum lucidum* or cleer partition, ſevering or parting in ſunder theſe two ventricles.

The four ventricles thereof.

The magnitude of the upper ventricles of the brain.

The *Septum Lucidum*.

This *Septum lucidum*, or cleer or thin partition, is nothing elſe than a portion of the brain indifferently ſolid, but very clear, that ſo through this partition the animall ſpirits contained in theſe two ventricles may mutually paſs and be communicaced, and yet no other groſſer ſubſtance may pierce the thin denſity thereof.

Why the Palſy of one ſide is not preſently communicated to the other.

Wherefore it is not to be feared, that the water contained in one of the ventricles may paſs to the other through this partition, as I have oft times obſerved to the great admiration of the ſpectators in the dead bodies of ſuch as dyed of the Palſy, in which I have found the ventricle of that ſide which was taken with the Palſy much dilated, according to the quantity of the water contained therein, the other being either wholly empty and without any; or certainly no fuller than in any other, dead through any other occaſion. For ſome affirm that there is a certain kind of wateriſh moiſture alwayes to be found in the ventricles, which may be made by the condenſation of the Animall ſpirits by the force of the deadly cold. But theſe two firſt ventricles of the brain go into one common paſſage, as both the bellows of a fornace, whereby the ſpirit inſtructed with the ſpecies of things goes into the under, or middle ventricle from the former. In theſe ſame firſt ventricles the *Plexus Choroides* is to be conſidered, and in like manner the paſſage by which the groſſer excrements are driven or ſent into the pituitary Glandule.

The third Figure repreſents the Cerebellum *with the wormy proceſſes ſeparated from it.*

AB. The right and left part of the After-brain.

CD. The *anterior* and *poſterior* regions of the middle part of the After-brain.

E. The *anterior* wormy proceſſe.

F. The *poſterior* wormy proceſs.

GG. In this place the After-brain did grow to the ſpinall marrow.

H. The cavity in the ſpinall marrow maketh the foruth ventricle. *IK.* The *anterior* and *poſterior* proceſſes of the brain, called *vermi-formes* or the wormy proceſſes.

For

This *Plexus Choroides* is nothing else, but a production of the *Pia mater* diverſly folded with the mutuall implication of veins and arteries woven in the form of a net. Theſe veſſels are of magnitude and capacity ſufficient, both to yeild life and nouriſhment to that particle to which they are faſtened, as alſo for the generation of the Animall ſpirits, as which take fit matter from the veins ſtretched forth into the ſame *Plexus*, the hind artery and vein *Torcular*; and alſo from the air entring into the brain by the mamillary proceſſes. But the mamillary proceſſes are certain common wayes for conveyance of the air and ſmells into the brain, and carrying of excrements from the brain.

The *Plexus Choroides*.

The *Proceſſus Mamillares*.

For thus in them who have the Catarrhe and *Coriza* or poſe, neither the air, nor ſmels can penetrate into the brain; whence frequent ſneeſings enſue, the brain ſtrongly moving it ſelf to the expulſion of that which is troubleſome to it. But of the excrements of the brain, whether bred there, or proceeding from ſome other part, ſome are of a fumid and vaporous nature, which breath inſenſibly through the Sutures of the skull; Others are groſs and viſcid, of which a great part is expelled by both theſe productions, or through each of them. For thus in the Poſe you may ſee ſome who have one of their noſtrils ſtopt, the other running, and ſome who have both obſtructed. The moſt proper benefit of the two firſt ventricles of the brain is to entertain the Phantaſie as in a convenient ſeat and habitation, ſeeing the mind there eſtimates and diſpoſes in order the ſpecies of things brought in from the externall ſenſes, that ſo it may receive a true judgment of them from reaſon which reſides in the middle ventricle.

The uſe of the upper ventricles of the Brain.

The third ventricle is ſeated between the hindermoſt extremities of the former ventricles, and the laſt ventricle of the *Cerebellum*. In this ſix parts preſent themſelves to our conſideration, that is, the *Pſalloides* or Arch, the *Conarium*, or pine Glandule, the Buttocks, wormlike productions, the Baſon and paſſage which is from this middle into the laſt & hindmoſt ventricle. The *Pſalloides* or Arch is nothing elſe, but the cover of the middle ventricle, reſembling a roof borne up with three ſtayes or pillars, the one whereof is extended to the noſe under the *Septum lucidum*, the two other on each ſide one, look towards the back part of the brain. This is the reaſon of this figure which is outwardly convexe and inwardly concave, to wit, that there might be free ſpace for that motion which the Animall ſpirit inwardly produces, and beſides that it might more eaſily ſuſtain the burden of the brain lying upon it. For an arched figure is the moſt convenient of all other to ſuſtain a weight.

The ſeat of the third ventricle of the brain. The parts to be conſidered in it.

What the *Fornix* or Arch is and the uſe thereof.

The *Conarium* or Pine glandule, is a ſmall Glandule of the ſame ſubſtance with the brain, round and ſomewhat long, like a Pine Apple, from whence it hath the name; this Glandule is ſeated over againſt a ſmall hole which deſcends to the loweſt ventricle. It hath this uſe, to ſtrengthen the diviſion of the veſſels led thither with the production of the *Pia mater* for the generation of the Animall ſpirits, and the life and nouriſhment of the brain.

What the *Conarium* or pine Glandule is.

The *Nates* or Buttocks are ſubjected or placed under this Glandule, that is, bodies of a ſolid and white ſubſtance drawn out in length like a childs buttocks, eſpecially in beaſts, and chiefly in a ſheep. Theſe buttocks have ſuch a ſolid ſubſtance, that ſo they may keep open and free the paſſage, or channell that runs down from the middle to the lower ventricle, by means of which the Brain participates with the *Cerebellum*.

What the *Nates* or Buttocks are.

The worm is a production of the *Cerebellum* or After-brain, to wit, a portion of the ſame being in the top or beginning and as it were in the entrance thereof, being like many little circles or wheels mutually knit together by ſlender membranes; and it is ſo called becauſe it reſembles thoſe thick white worms which are found in rotten wood. It doth as it were perform the office of a porter to the formerly mentioned paſſage, that it may give way and entrance into the *Cerebellum*, to a neceſſary quantity of ſpirits, when need requires; leſt that, if they ſhould ruſh with a ſodain violence into the *Cerebellum*, they might confound the imprinted notions of things to be remembred.

What the worm *is*.

The *Pelvis* or Baſon is a paſſage appointed for the carrying away of the groſs excrements by the palate, and is ſo called becauſe it hath the ſimilitude and uſe of a Baſon or Tunnell: it deſcends from the third ventricle into the Glandule which is ſeated between the proceſſes of the wedg-bone called the ſaddle thereof, as you may perceive by putting in a ſpathern. Now there remains the laſt of the ſix parts propoſed to our conſideration in the third ventricle, that is, the Channell or paſſage running from this third ventricle into the fourth, for the uſe formerly mentioned.

Here the *Pelvis* or Baſon is confounded with the Tunnell.

This Channell deſcending in its originall from the Baſon, goes from thence under the buttocks into the laſt ventricle, the *Meninges* being perforated; which that you may ſhew, it is fit you put the end of a ſpathern through it. The benefit of a third ventricle is, that it may be as a Tribunall or Judgment-ſeat, to the Reaſoning faculty, when the mind will draw concluſions from things ſeen.

The Channell from the third into the fourth ventricle.

The fourth and Fifth figure of the Brain.

FIG. V.

VI

Figure 5.

RRR. The lower *superficies* of the callous body reflected.

SIV. The *triangular* surface of the *Fornix* or Arch.

XX. The lower part of the partition of the ventricles continuated with the Arch.

YY. The upper part of the partition continued with the callous body.

Figure 6.

AAA. The lower surface of the Arch.

BC. Two corners of the Arch, by which it is continuated with the ventricles.

DE. The right and left ventricles.

FG. Arteries climbing up from the sleepy arteries through the lower side of the ventricles for the forming of that complication of vessels which is called *Plexus choroides*.

H. A vessell issuing out of the fourth *Sinus* under the Arch, and passing into the third ventricle.

IKL. The division of this vessell, a part whereof goeth to the right ventricle at *K.* and another to the left at *L.*

MN. The *Plexus choroides* made of the artery *FG.* and the vessel *H.*

OO. Small veins passing through the ventricles of the brain, produced from the vessels *K.* and *L.* *P.* Other veins arising from the same, dispersed without the ventricles into the *Pia mater*. ♎ A passage from the third ventricle unto the *Bason* or *Tunnell*. *RS.* Canales or *Sinus* graven or furrowed in the substance of the ventricles; in which the phlegm is led along to the orifice of the foresaid passage marked with ♎.

The Sixth figure of the Brain.

XI.

XII.

X.

Figure 10.

AA. Parts of the spinal marrow cut from the Brain.

BC. The places where this marrow did grow unto the brain.

DE. The Testicles. *FG.* The buttocks. *H.* the Pine Glandule.

From *I* to *K.* a part of the third ventricle going to the fourth, under the Testicles.

KLMN. A part of the fourth ventricle which is engraven in the marrow. *O.* The top of the fourth ventricle. *P.* The place where the spinall marrow goeth out of the skull. *Figure* 11. *AB.* Parts of the optick nerves. *CD.* The sleepy arteries. *E.* The Bason or Tunnell hanging down. *F.* A hole or perforation of the *dura meninx*, through which the Tunnel reacheth unto the Glandule. *GG.* Parts of the second conjugation of sinews. *Figure* 12. *A.* The Glandule. *B.* The Bason or Tunnell called *Pelvis* or *Infundibulum*. *CDEF.* The four holes through which the phlegmatick excrement issueth.

The

The fourth ventricle is seated in the place we formerly mentioned; it is less than the rest, but more solid; less as that which was not to receive the spirit before it was purified, and clensed from all impurities; but more solid, that it might contain it the safer. The use thereof is, to be as a treasury and store-house of the opinion, and judgments which reason shall decree, that when need requires, we may fetch and draw them from thence as laid up in store. I know *Galen* and the Greek Physitians have not so distinguished in places the three fore-mentioned faculties; but have written that they all are all over confused through the whole substance of the brain, which opinion also *Fernelius* in his *Pathologia* hath renewed. Yet I had rather follow this opinion, as commonly received and celebrated by the *Arabian* Physitians. The fourth ventricle of the brain.

The Mamillary processes are the instruments and passages of smelling being of the same substance with the brain, and like nerves, which run out from the hind horns of the upper or foremost ventricles of the brain to the *Ethmoides* and spongy bones of the nose, that hence they may receive the divers kinds of smells, and carry them into the Brain. But although they be like nerves, yet they are not accounted nerves because they go not out of the skul. The use of the Mamillary processes.

CHAP. VIII.

Of the seven conjugations of the Nerves of the Brain, so called, because they always shew the Nerves conjugated and doubled, that is, on each side one.

THe nerves are the wayes and instruments of the Animall spirit and faculty, as of which those spirits are vehicles, as long as they are contained in the brain; they consist of the only and simple marrowey substance of the brain, or spinall marrow. But passing forth of the brain, they have another membranous substance which involves them joyned with them from the two membranes of the brain; and according to the opinion of some Anatomists, they have also a third from the Jigaments drawn as well from divers others, as from these by which they are tyed to the *Vertebra's*; Yet this opinion seems absurd to me, seeing such a membrane, as that which is insensible, wholly repugnes the condition of a nerve, which is to give sense to the parts to which it is inserted. What a Nerve or Sinew is. Its substance. Whether the nerve have a third membrane from the Ligaments of the *Vertebra's*.

The magnitude of the nerves is different, according to the divers necessity of sense incident to the parts into which they are inserted. Their figure is round, and long, like to a conduit pipe to carry water in; the membranes of the brain, with which the nerves are covered, being dilated and stretched over them, after the same manner that the processes of the *Peritoneum* involves the spermatick vessels, with which they go down to the Testicles, and take life and nourishment by the capillary veins and arteries, which descend to them with the membranes. They are made for this use, that they may impart sense to the sensitive parts, and motion to these that are fit to be moved. All the nerves descend from the brain either mediately or immediately; their Number is seven and thirty pair, or conjugations, whereof seven have their originall immediately from the brain, the other thirty from the spinall marrow. Their magnitude. Their figure. Their use. Their number.

The first conjugation of the nerves of the brain is thicker than all the rest, and goes to the eyes, to carry the visive spirit to them. These arising from divers parts of the brain, in the middle way before they go out of the skull meet together crosswise like the Iron of a Mill (which is fastened in the upper stone) going into one common passage with their cavities not visible to the eye; that so the spirits brought by those two nerves may be communicated, and they are mutually joyned and meet together so, that being driven back from one eye they may flie back into the other. An argument whereof may be drawn from such as aim at any thing, who shutting one of their eyes see more accurately; because the force of the neighbouring spirits united into one eye, is more strong than when it is dispersed into both. This conjugation when it comes into the glassie humor, is spent in the structure of the net-like coat which contains this humor on the back part. The first conjugation of nerves.

The second conjugation goes into many parts, at its passing forth of the skull; and in the bottom of the circle of the eye it is distributed into the seven muscles moving the eyes. The second conjugation.

The third is twofold, in the passage out of the skull it is likewise divided into many branches, of which some are carryed to the temporall muscles, into the *Masseteres* or grinding muscles into the skin of the face, forehead and nose; Othersome are sent into the upper part of the cheek, and the parts belonging to it, as into the teeth, gums and the muscles of the upper lip; and those which are called the round which incompass the mouth on the inside; the last are wasted in the coat of the tongue, to bestow upon it the sense of tasting. The third conjugation.

The fourth conjugation is much smaller, and is almost wholly wasted upon the coat of the Palat of the mouth, to endue it also with the sense of tasting. The fourth conjugation.

The fift at its originall and having not as yet passed forth of the skul, is divided into two, The fift conjugation.

and ſends, the greater portion thereof to the hole of the ear, or paſſage of hearing, that it may ſupport the auditory faculty; and it ſends forth the other leſſer portion thereof to the temporall muſcles by the paſſage next to it; by which the ſecond conjugation paſſes forth.

The ſixt conjugation.

The ſixt being the greateſt next to the firſt, paſſing entire forth of the skull, imparts ſome ſmall branches to certain muſcles of the neck and throttle, and then deſcending into the cheſt, it makes the recurrent nerves, and diſperſed over all the parts of the two lower bellies, it paſſes even to the bladder and teſticles, as we ſhewed in the former book.

The ſeventh conjugation.

The ſeventh is inſerted and ſpent upon the muſcles of the bone *Hyoïs*, the tongue, and ſome of the throttle, to give them motion; it paſſes forth of the skull by the hole of the nowl bone at the extuberancies thereof.

The ſeventh figure ſhewing the eighth conjugation of the Nerves of the Brain.

FIG. I.

FIG. II.

AA, 2. The brain.
BB 1, 2. the After-brain. *CC* 1, 2. the ſmelling of the brain. which ſome call the mamillary proceſſes.
D 1, the beginning of the ſpinall marrow out of the Baſis of the brain.
F 1, 2. a part of the ſpinall marrow when it is ready to iſſue out of the skull.
FF 1, 2. the mamillary proceſſes which ſerve for the ſenſe of ſmelling.
GG 1, 2. the optick nerves.
H 1. the coition or union of the optick nerves.
II 1, 2. the coat of the eye whereinto the optick nerves are extended.
KK 1, 2. the ſecond pair of the ſinews ordained for the motion of the eyes.
LL 1, 2. the third pair of ſinews, or according to the moſt Anatomiſts, the leſſer root of the third pair.
MM 1, 2. the fourth pair of ſinews or the greater root of the third pair.
N 2. a branch of the third conjugation derived to the muſculous skin of the forehead.
O 2. a branch of the ſame to the upper jaw.
PP 2. another into the coat of the noſtrils.
Q 2. another into the temporall muſcles. *R* 2, a branch of the fourth conjugation crumpled like the tendrill of a vein. *S* 2. a branch of the ſame reaching unto the upper teeth, and the gums. *T* 2. another of the ſame to the lower jaw. *V* 2. a Surcle of the branch *T*, to the lower lip. *XX* 2. another ſurcle from the branch T, to the roots of the lower teeth. *YY* 2. the aſſumption of the nerves of the fourth conjugation unto the coat of the tongue. *Z* 1, 2. the fourth pair are vulgarly ſo called which are ſpent into the coats of the palat. *a* 1, 2. the fifth pair of ſinews which belong to the hearing. *e*, the *Auditory* nerve ſpred abroad into the cavity of the ſtony bone. *, a hard part of the fift conjugation above, the * which may be counted for a diſtinct nerve. *b* 1, 2. a ſmall branch derived from this harder part of the firſt pair. *c*. 1, 2. a lower branch from the ſame originall. *d* 1, 2. this nerve is commonly aſcribed to the fift pair, but indeed is a diſtinct conjugation which we will cal the Eighth, becauſe we would not interrupt the order of other mens accounts. *e* 1, 2. the ſixt pair of ſinews. *f* 2. a branch from them derived to the neck and the muſcles couched thereupon. *g* 2. another branch to the muſcles of the Larinx or throttle. *h* 1, 2. the ſeventh pair of ſinews. *i* 1. the union of the ſeventh pair with the ſixt. *l* 2. a propagation of the ſeventh pair to thoſe muſcles which ariſe from the Appendix called *Styloides*. *m* 2. Surcles from the ſeventh conjugation to the muſcles of the tongue, the bone *Hyoïs* and the Larinx. *o p q* 1. three holes; through the hole *o* the phlegm iſſueth out of the third ventricle of the brain to the Tunnell, and at *pq*. is the paſſage of the *Soporary* arteries to the ventricles of the Brain.

CHAP.

CHAP. IX.

Of the Rete Mirabile, *or wonderfull Net, and of the Wedg-bone.*

THe Animall ſpirit is made of the vitall, ſent from the heart by the internall ſleepy Arteries to the brain. For it was requiſite that it ſhould be the more elaborate, becauſe the action of the Animall is more excellent than that of the vitall; nature hath framed a texture of Arteries in many places running croſs one another, in the form of a Net divers times doubled; (whereupon it had the name of the wonderfull Net) that ſo the ſpirit by longer delay in theſe Labyrinthian or maze-like turnings, might be perfectly concocted and elaborate, and attain to a greater fitneſs to perform the Animall functions.

The exiſtence of the Animall ſpirit.
What the *Rete Mirabile* is.

This wonderfull Net ſituate at the ſides of the *Apophyſes clinoides* or productions of the wedg-bone, is twofold; that is, divided by the pituitary Glandule which is ſituate between the ſaid *Apophyſes Clinoides*, having the wedgbone lying under them, next to the *Craſſa Meninx*, being perforated on the right and left ſide, next to which lye bones as rare as a ſponge even to the Palat, by which the Phlegme is purged by the mouth and noſe; and therehence, I think, that ſpattle flows, which ſuch as have a moiſt brain, continually ſpit out of their mouth.

The ſite and number.

The Eight Figure of the brain.

FIG. I.

A, The brain.
E, the *Cerebellum* or after-brain.
C, a proceſs of the brain, but not that which is called *Mamillaris*.
DD. The marrow of the back as it is yet within the skull.
E, the *Mamillary* proceſs or inſtrument of ſmelling.
F, the optick nerve.
G, the coat of the eye into which the optick nerve is ſpread.
H, the nerve that moveth the eye or the ſecond pair.
I, the third conjugation, or the harder and leſſer branch of the nerves of the third conjugation brought forward.
K, the fourth conjugation or the greater and thicker nerve of the third pair bending downward.
L, a branch of the nerve marked with *I*, which goeth to the forehead.
M, another branch of the nerve *I*, reaching to the upper jaw. *NN*, a nerve proceeding from the branch *I*, inrexed or woven with the coat of the noſe. *O*, the nerve of the temporall muſcle iſſuing from the branch *I*. *P*, a nerve contorted of the nerves *K* and *b*. *Q*, a nerve proceeding from the branch *K*, to the ſockets of the upper teeth.
R, a nerve creeping from the nerve *K* to the lower jaw. *S*, a ſuſcle of the branch *R*, offered to the lower lip. *TT*, other ſurcles from the branch *R*, attaining to the lower teeth. *VV*, a branch of the nerve *K*, diffuſed into the coat of the tongue. *XX*, the fourth pair of ſinews which go into the coat of the palat. *Y*, the fifth pair of ſinews which are the nerves of hearing. *a*, the membrane of the ear, unto which that fifth nerve goeth *bc*, two ſmall branches of the fifth conjugation uniting themſelves with the nerve *P*. *d*, the eight conjugation or a nerve of the fifth pair attaining unto the face. *ee*, the ſixt pair of nerves. *f*, a branch from the nerve *e*, reaching to the muſcles of the neck. *g*, ſmall branches derived unto the throttle or *larinx*. *h*, the bifurcation of the nerve into two branches. *iii*, an inner branch hanging to the rack bones, and ſtrengthning the *intercoſtall* nerves, and is therefore called *Intercoſtalis*. *kk*, Surcles of the utter branch going to the heads of the muſcles, to the breaſt bone and to the coller-bones. *lm*, branches of the right nerve *l*, making the right Recurrent nerve. *nn*, the inſertion of the recurrent ſinews into the muſcles of the *larinx*. *op*, branches of the left nerve making the left recurrent ſinew *p*. *qq*, branches from the ſixt conjugation going to the coat of the lungs. *r*, ſmall nerves of the heart and of the purſe thereof called the *Pericardium*, as alſo ſome approaching to the coats of the lungs. *ſ*, nerves on either ſide ſent to the ſtomach. *t*, the right ſtomach nerve going to the left orifice of the ſtomach. *uu*, the left ſtomach nerve going to the right orifice of the ſtomach. *x*, a nerve from the branch *u*, paſſing into the hollowneſs of the liver. *y*, the nerve belonging to the right ſide of the kell. *z*, the nerve belonging to the colick gut. *a*, a nerve creeping to the gut called *duodenum* and the

the beginning of the *jejunum* or empty gut. θ, a nerve implanted in the right side of the bottom of the stomach. ϗ, a nerve belonging to the liver & bladder of gall. ϛ, a nerve reaching unto the right kidney. ϟ, a branch reaching the *Meſenterium* and the guts. ζ, a branch ſprinkled to the right part of the bladder. η, a branch going through the left part of the kel. θι, ſurcles derived to the colick gut and the kel. κ, ſmall branches inſerted into the ſpleen. λλ, a nerve approaching to the left ſide of the bottom of the ſtomach. μ, a branch belonging to the left ſide of the *Meſentery* and the guts. ν, a branch which attaineth to the left kidney. ξ, ſmall nerves creeping through the left ſide of the bladder. ο, the ſeven pair of ſinews. ππ, a branch derived from the fixt conjugation to the muſcles which ariſe from the proceſs called *Styloides*. ρ, a branch of the ſeventh conjugation which goeth to the muſcles of the tongue, of the bone *hyois*, and of the throttle or *larinx*. ϛ, a conjunction or coition of the 6. and 7. pair into one Nerve.

What the *Apophyſes Clinoides* are.

Theſe *Apophyſes clinoides* are certain productions of the *Os baſilare* or wedg-bone, (called the Saddle thereof,) between which, as I ſaid, the pituitary glandule lies with part of the wonderfull net. There is a great controverſie amongſt anatomiſts concerning this part; for *Veſalius* denies that it is in man, *Columbus* admits it, yet he ſeems to confound it with the *Plexus Choroides*. Truly I have obſerved it alwayes after the manner, as *Sylvius* alledges againſt *Veſalius*. It remains, that we recite the perforations of the skull, becauſe the knowledg of theſe much conduces to the underſtanding of the inſertions of the veins, arteries and nerves.

Whether the *Rete mirabil* differ from the *Plexus Choroides*.

CHAP. X.

Of the holes of the inner Baſis of the skull.

IN the firſt place are reckoned the holes of the bone *Ethmoides*; then thoſe of the optick nerves. Thirdly, of the nerves moving the eyes. Fourthly, of that portion, of the nerves of the fourth conjugation which go to the temporall muſcles. Fiftly are reckoned, theſe holes ſcarce viſible, ſituate under the pituitary glandule, by which the ſpettle is evacuated. Sixthly, that hole which is in the wedg-bone made for the entrance of the internall ſleepy Arteries, compoſing the wonderfull Net, and then paſſing into the brain by a great ſlit. That perforation which we reckon in the ſeventh place is commonly double, made for the entrance of one of the branches of the internall Jugular vein. The eight hole is ſomewhat long, of an ovall figure, by which, part of the third conjugation and all the fourth conjugation paſſes forth. The ninth are the auditory paſſages. The tenth are very ſmall holes, and give way to the vein and artery going to the auditory paſſage, above the *foramen cæcum*. In the eleventh place are reckoned the perforations which yeeld paſſage forth to the ſixth pair of nerves, to part of the ſleepy Arteries, and of the internall Jugular. In the twelfth thoſe which yeeld a way out to the ſeventh conjugation. The great hole of the Nowl-bone through which the ſpinall marrow paſſes, is reckoned the thirteenth. The fourteenth is that, which moſt commonly is behind that great hole, by which the Cervicall veins and arteries enter in.

CHAP. XI.

Of the perforations of the externall Baſis of the Brain.

THere is a hole on each ſide at the Eye-brows, by which paſſes a ſmall nerve from the third conjugation coming out of the cavity of the Orb of the eye, and going by the forehead bone to the eye-brows, that it may give motion to the two muſcles of the upper eye-brow and forehead. Yet oftentimes the hole is but to be ſeen on one ſide, oft times there is a cleft in ſtead thereof, otherwhiles it is not perforated nor cleft at all. The ſecond, is the perforation of the greater corner of the ey, by which a portion of the nerves of the third conjugation deſcends to the coat of the noſe; in this hole the *Glandula Lachrymalis* is ſeated. The third is ſeated under the eye, that it may give way to the other portion of the nerves of the third conjugation going to the partt of the face, and the teeth of the upper jaw. The fourth is at the beginning of the palat, amongſt the cutting or ſhearing teeth, through which a vein, an artery and the coat of the palat paſſes out. In the fifth order are reckoned the perforations of the palat, by which the nerves deſcend from the fourth conjugation, to give, or cauſe the taſte. In the ſixt order are ranked the holes of the palat ſerving for the reſpiration, and the flegm falling from the brain by the noſtrils. And there is a cleft under the yoak bone aſcending into the Orb of the eye, by which there is a way, as wel for the nerves of the third conjugation to the temporall muſcles, as alſo for certain veins and arteries. But alſo there is noted another hole at the mamillary proceſs, which is not perforated in the judgment of the ſenſe. Beſides there is thought to be another at the hind root of the ſame proceſs, by which a certain ſmall vein paſſes from the Jugular to the *Torcular*. But I have only noted theſe three paſſages by the way, becauſe there is ſo much variety in them, that nothing can be certainly ſaid of them.

CHAP.

CHAP. XII.

Of the Spinall Marrow, or Pith of the Back.

THe ſpinall Marrow is like a River running from the fountain of the brain. This ſends nerves for ſenſe and motion to all the neighbouring parts under the head, ſpreading its branches as from the body of a tree. Theſe branches, as we ſhall hereafter ſhew, are on each ſide thirty. This ſame ſpinall marrow is covered with the two membranes inveſting the brain, diſtinguiſhed by no diſtance of place, as in the brain. But alſo it hath another membrane added to theſe, being very hard and denſe, which keeps it from being broken and violated by the violent bending of the body forwards and about. The diſeaſes of this marrow do almoſt cauſe the like Symptomes, as the diſeaſes of the brain; For they hurt the ſenſe and motion of all the parts lying beneath them: as for example; If any of the *vertebra's* of the back bone, be moved out of their place, there follows a diſtortion or wreſting aſide of the Marrow; but then eſpecially if it happen that one of the *vertebra's* be ſtrained, ſo ſharp and bitter a compreſſion urges the marrow by reaſon of the bony body of the *vertebra*, that it will either rend it, or certainly hinder the paſſage of the ſpirit by it. But by theſe ſame holes of the *vertebra's* the veins and arteries go to the ſpinall marrow for to give life and nouriſhment to it, as the nerves by them paſs forth into all the lower parts of the body.

What the Spinall marrow is.

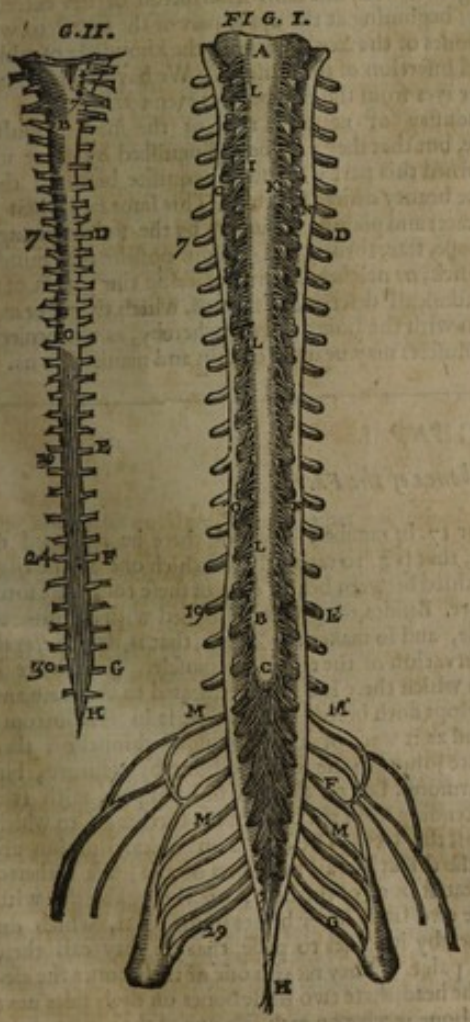
The coats of the ſpinall marrow.

The diſeaſes from the hurting of the ſpinall marrow.

Figure 1. *ſheweth the form of the ſpinall marrow properly ſo called, with its membranes, and the nerves proceeding from it.*

Figure 2. *the ſpinall marrow naked and bare, together with its nerves, as moſt part of Anatomiſts have deſcribed it.*

The tenth Figure of the ſpinall marrow.



A. The beginning of the ſpinall marrow where it fals out of the skull.

B. The thickneſs thereof in the ſpondels or rack bones of the loins.

C. The diviſion thereof into ſtrings, or hairy threds.

D. The ſeven nerves of the neck.

From *D.* to *E.* or from 7. to 19. ſhew the nerves of the back.

From *E.* to *F.* the nerves of the loins.

From *F.* to *G.* the nerves of the *Os ſacrum* or holy bone.

H. The end of the marrow.

IKL. Do ſhew how the nerves do iſſue from the marrow in ſtrings.

MM. The knots of the ſinews made of the conjunction of thoſe ſtrings.

NO. The membranes that inveſt the marrow.

Figure 2.

A. The beginning of the ſpinall marrow in the skull.

3,4,5,6,7. theſe Characters ſhew (according to *Veſalius* opinion) how the conjugations of the nerves of the brain do take their originall from the marrow remaining yet within the skull.

B. The egreſs of the ſpinall marrow out of the skull.

C. The cords or ſtrings whereinto it is divided.

D 7. The marrow of the neck and ſeven pair of ſinews. *E* 19. Twelve pair or conjugations of nerves proceeding from the marrow of the Cheſt.

F 24. The marrow of the loins and 5. pair of ſinews. *G* 30. the marrow of the holy bone and 6. pair of ſinews.

H. The extremity or end of the ſpinall marrow.

The End of the Fifth Book.

The Sixth Book,

Treating of the *Muſcles and Bones, and the other Extreme parts of the BODY.*

The Preface.

PEradventure ſome may wonder that I have ended my fifth book of Anatomy, before I have fully deſcribed all the parts of the head, the which ſeemed as it were only appointed for that purpoſe. Therefore I muſt yeeld a reaſon of this my intention. I have a deſire in one Treatiſe and as it were at one breath, to proſecute the Anatomy of the Muſcles. Wherefore becauſe the parts of the head not yet deſcribed, principally conſiſt of the Muſcles, therefore I deſired to comprehend them together with this ſame deſcription of the extreme parts of the body; beginning at the upper part of the face; to wit, the eyes: but having firſt deſcribed the bones of the face, without the knowledg of which it is impoſſible to ſhew the originall and inſertion of the Muſcles. We have formerly noted, that by the face is meant whatſoever lyes from the Eye-browes even to the Chin. In which there is ſuch admirable induſtry of nature, that of the infinite multitude of men you cannot find two ſo like, but that they may be diſtinguiſhed by ſome unlikeneſſe in their faces; alſo it hath adorned this part with ſuch exquiſite beauty, that many have dyed by longing to enjoy the beauty deſired by them. This ſame face albeit it little exceeds halfe a foot, yet it indicates and plainly intimates by the ſodain changes thereof, what affections and paſſions of hope, fear, ſorrow and delight poſſeſſe our minds; and what ſtate our bodies are in, ſound, ſick, or neither. Wherefore ſeeing the face is of ſo much moment, let us return to the Anatomicall deſcription thereof, which that wee may eaſily and plainly perform we will begin with the bones thereof, whereby, as we formerly ſaid, the originall and inſertion of the Muſcles may be more certain and manifeſt to us.

The deſcription of the bones being unknown, it muſt neceſſarily follow that the originall and inſertion of the muſcles muſt be ſo alſo.

The endowments of the face.

The countenance is the bewrayer of the will.

CHAP. I.

Of the bones of the Face.

THe bones of the face are 16, or 17. in number. And firſt, there be reckoned 6. about the orbs of the eyes, that is 3. to each orb, of which one is the bigger, another leſſer, and the third between both; each of theſe touch the forehead bone in their upper part. Beſides, the greater is joyned with a ſuture to the proceſſe of the ſtony bone, and ſo makes the *Zygoma*, that is, the *Os Jugale* or yoak bone, framed by nature for preſervation of the temporall muſcle. The leſſer is ſeated at the greater corner of the eye, in which there is a hole perforated to the noſe, and in this is the glandule in which the Ægylops doth breed. The middle is in the bottom, or inner part of the orb, very ſlender and as it were of a membranous thinneſſe: then follow the two bones of the noſe which are joined to the forehead bone by a ſuture, but on the foreſide between themſelves by harmony. But on the back or hind part with two other bones, on each ſide one, which deſcending from the bone of the forehead (to which alſo they are joined by a ſuture) receive all the teeth. Theſe two in *Galens* opinion are ſeldome found ſeparated. But theſe are the thickeſt of all the bones of the face hitherto mentioned, knit by a ſuture with the greateſt bone of the orb, on the back part with the wedg-bone, on the inner ſide with the two little inner bones of the palat, which on the inſide make the extremity thereof, whereby it comes to paſſe, that we may call theſe bones the hinder, or inner bones of the palat. They reckon one of theſe bones the eleventh and the other the twelfth bone of the head; theſe two little bones on their ſides next to the winged productions of the wedge-bone, receive on each ſide one of the nerves of the

Bones in each orb of the Eye.

What the *Zygoma* is, and what uſe it hath.

The *Ægylops*.

The two bones of the noſe.

The two inner bones of the palat.

fourth

fourth conjugation, which in the former book, we ſaid were ſpent upon the membrane of the palat.

And in *Galens* opinion there be other two in the lower Jaw, joined at the middle of the chin; although ſome think it but one bone, becauſe by the judgement of ſenſe there appears no diviſion or ſeparation therein. But you may ſee in children how true this their ſuppoſition is, for in men of perfect growth it appears but one bone; theſe two are reckoned for the thirteenth and fourteenth bones. Now theſe two bones making the lower Jaw, have in in their back part on each ſide two productions, as they lye to the upper Jaw, the one of which repreſents the point of a ſword, and is called the *Corone*; the other is obtuſe and round; which is inſerted into the cavity ſeated at the root of the proceſſe of the ſtony bone, neer to the paſſage of the ear.

The two bones of the Jaw.

Two proceſſions on each ſide of the lower Jaw.

This may be ſtrained to the forepart by violent gaping, by retraction of the muſcles ariſing from the wing-like proceſſes, and ending at the lower angles of the broader part of the ſame Jaw.

The Luxation of the lower Jaw.

This Jaw is hollow as alſo the upper, eſpecially in the back-part, being filled with a white and glutinous humour, conducing to the growth of the teeth. This humour hath its matter from the blood brought thither by the veſſels, veins, arteries and nerves from the third conjugation entring in here by a paſſage large enough. Whereby it comes to paſſe, that this part is not only nouriſhed and lives, but alſo the teeth receive ſenſe by the benefit of the nerves entring thither with the vein and artery, by ſmal holes to be ſeen at the lower roots of the teeth; and thence it is that a beating pain may be perceived in the tooth-ach, becauſe the defluxion may be by the arteries; or rather becauſe the humour flowing to the roots of the teeth, may preſſe the artery in that place; beſide alſo you may ſee ſome appearance of a nervous ſubſtance in the root of a tooth newly pluckt out.

The lower Jaw filled with a marrowy humor.

How the teeth feel.

Why the teeth have a beating pain.

But alſo you muſt conſider, that this Jaw from its inner capacity produces at the ſides of the chin two nerves of a ſufficient magnitude, over againſt the lower dog-teeth, and the firſt of the ſmaller grinding teeth, as I have noted in the deſcription of the nerves of the third conjugation. I have thought good to put thee in mind of theſe, that when thou ſhalt have occaſion to make inciſion in theſe places, thou maiſt warily and diſcreetly handle the matter, that theſe parts receive no harme.

The nerves of the lower Jaw muſt be obſerved.

There remains another bone ſeated above the palat, from which the griſtly partition of the noſe ariſes, being omitted of all the Anatomiſts, for as much as I know. Now therefore that you may the better remember the number of the bones of the face, I will here make a repetition of them.

The bone of the noſe above the palate, or the partition of the noſe.

There are ſix of the orbs of the eyes, at each three. The ſeventh and eight wee may call the Naſall, or noſe bones. The ninth and tenth the Jaw-bones. The eleventh and twelfth are called the innee bones of the palat. The thirteenth and fourteenth the bones of the lower Jaw. The partition of the noſe may be reckoned the fifteenth.

Now it remains having ſpoken of theſe bones, that wee treat of the teeth, the Eye-browes, the skin, the fleſhy panniele, the Muſcles, and laſtly, the other parts of the face.

CHAP. II.

Of the Teeth.

The teeth are of the number of the bones; and thoſe which have the moſt have thirty two, that is, ſixteen above, and ſo many below; of which in the forepart of the mouth there are four above and as many beneath, which are called *Inciſorii* cutting or ſhearing teeth, to cut in ſunder the meat, and they have but one root. To theſe are joyned two in each Jaw, that is, on each ſide of the other one, which are called *Canini dentes*, Dog-teeth, becauſe they are ſharp and ſtrong like dogs-teeth; theſe alſo have but one root, but that is far longer then the other have.

The teeth are bones.

The ſhearing teeth.

The Dogteeth

Then follow the *Molares* or Grinders, on each ſide five, that is, ten above, and as many below, that they may grind, chaw, and break the meat, that ſo it may be the ſooner concocted in the ſtomach; for ſo they vulgarly think, that meat well chawed is halfe concocted; thoſe grinders which are faſtened in the upper Jaw, have moſt commonly three roots, and oft-times four. But theſe which are faſtened in the lower, have only two roots, and ſometimes three, becauſe this lower jaw is harder than the upper ſo that it cannot be ſo eaſily hollowed, or elſe becauſe theſe teeth being fixed and firmly ſeated, needed not ſo many ſtayes as the upper, which as it were hang out of their ſeats. The ſhearing teeth cut the meat becauſe they are broad and ſharp; the dog-teeth break it, becauſe they are ſharp pointed and firm; but the grinders being hard, broad and ſharp, chaw and grind it aſunder. But if the grinders had been ſmooth, they could not fitly have performed their duty, for all things are chawed and broken aſunder more eaſily by that which is rough and unequall.

The Grinding teeth.

Why the upper grinding teeth have more roots.

The uſe of the teeth.

Wherefore they ſharpen their Milſtones when they are ſmoother than they ſhould be, by

The teeth are faſtened in the Iaws by *Gompheſis*.

by picking them with a ſharp Iron. The teeth are faſtened in the jawes by *Gompheſis*, that is, as a ſtake or nail, ſo are they fixed into the holes of their jaws; for they adhere ſo firmly thereto in ſome, that when they are pluckt out, part thereof followes together with the tooth; which I have often obſerved to have been alſo with great effuſion of blood. This adheſion of the teeth faſtened in their jaws, is beſides ſtrengthned with a ligament, which applies it ſelfe to their roots together with the nerve and veſſels. The teeth differ from the other bones, becauſe they have action whilſt they chaw the meat; becauſe being loſt they may be regenerated, and for that they grow as long as the party lives, for otherwiſe by the continuall uſe of chawing they would be worn and waſted away by one another. You may perceive this by any that have loſt one of their teeth, for that which is oppoſite to it becomes longer than the reſt, becauſe it is not worn by its oppoſite. Beſides alſo they are more hard and ſolid than the reſt of the bones, and indued with a quick ſenſe by reaſon of the nerves of the third conjugation which inſert themſelves into their roots; for if you rub, or grind a tooth newly pluckt out, you may ſee the remains of the nerve; they have ſuch quick ſenſe, that with the tongue they might judg of taſtes. But how feel the teeth, ſeeing they may be filed without pain? *Falloppius* anſwers, that the teeth feel not in their upper or exterior part, but only by a membrane which they have within. And the teeth have another uſe, eſpecially the fore-teeth, which is, they ſerve for diſtinct and articulate pronuntiation; for thoſe that want them faulter in ſpeaking, as alſo ſuch as have them too ſhort, or too long, or ill ranked. Beſides, children ſpeak not diſtinctly before they have their fore-teeth. And you muſt note that the infant as yet ſhut up in its mothers womb hath ſolid and bony teeth; which you may perceive by diſſecting it preſently after it is born.

The faſtening of the teeth into the Iaws is to be obſerved.

Wherein the teeth differ from the other bones.

For what uſe the teeth have ſenſe.

The fore-teeth help for the articulation of the voice.

But even as there are two large cavities in the forehead bone at the eye-browes, filled with a viſcous humor, ſerving for the ſmelling; and in like-manner, the air ſhut up in the mamillary proceſſes is for hearing; ſo in the jaws there be two cavities furniſhed with a viſcid humour for the nouriſhment of the teeth.

CHAP. III.

Of the Broad Muſcle.

NOw we ſhould proſecute the containing parts of the face; to wit, the skin, the fleſhy pannicle and fat; but becauſe they have been ſpoken of ſufficiently before, I will only deſcribe the fleſhy pannicle, before I come to the diſſection of the eye, that wee may the more eaſily underſtand all the motions performed by it, whether in the face or forehead.

Firſt, that you may more eaſily ſee it, you muſt curiouſly ſeparate the skin in ſome part of the face. For unleſſe you take good heed, you will pluck away the fleſhy pannicle together with the skin, as alſo this broad muſcle to which it immediately adheres, and in ſome places ſo cloſely and firmly, as in the lips, eye-lids and the whole forehead, that it cannot be ſeparated from it, Nature hath given motion, or a moving force to this broad muſcle, that whilſt it extends, or contracts it ſelf, it might ſerve to ſhut and open the eye. It will be convenient to ſeparate the muſcle thus freed from the skin, beginning from the forepart of the clavicles even to the chin, aſcending in a right line, and then turning back as far as you can; for thus you ſhall ſhew how it mixes it ſelf with the skin and the muſcles of the lips.

When thou ſhalt come to the eyes, thou ſhalt teach how the eye is ſhut and opened by this one muſcle, becauſe it is compoſed of the three ſorts of fibers; although by the opinion of all who have hitherto written of Anatomy, thoſe actions are ſaid to be performed by the power of two muſcles appointed for that purpoſe; one of which is at the greater corner on the upper part, the other reſembling a ſemicircle at the leſſer corner, from whence extending it ſelf to the middle of the griſtle *Tarſus*, it meets with the former ending there, but they are in part extended over all the eye-lid, whereby it commeth to paſſe that it alſo in ſome ſort becommeth movable. But although in publike diſſections theſe two muſcles are commonly wont to be ſolemnly ſhewed, after the manner I have related; yet I think, that thoſe which ſhew them know no more of them than I do. I have grounded my opinion from this, that there appears no other muſculous fleſh in theſe places, to thoſe which ſeparate the fleſhy pannicle, or broad muſcle, than that which is of the pannicle it ſelf, whether you draw your inciſion knife from the forehead downwards, or from the cheek upwards.

There are no particular muſcles appointed to open and ſhut the eye, for that is the work of the broad muſcle only. Divers reaſons to that purpoſe.

Beſides, when there is occaſion to make inciſion on the eye-browes, we are forbidden to doe it tranſverſe, leſt this broad muſcle falling upon the eye, make the upper eye-lid unmoveable: but if ſuch a cut be received accidentally, we are commanded preſently to ſtitch it up; which is a great argument that the motion of the upper eye-lid is not performed by its proper muſcles, but wholly depends and is performed by the broad muſcle. Now if theſe ſame proper muſcles which we have deſcribed ſhould be in the upper eye-lid, it ſhould

Why you muſt take heed of making a tranſverſe inciſionu pon the eyebrowes.

be

be meet, (becauſe when one of the muſcles is in action, the other which is its oppoſite or Antagoniſt, reſts or keeps holyday:) that when that which is ſaid to open the eye is imployed, the oppoſite thereof reſting, the upper eye-lid ſhould be drawn towards its originall, as we ſee it happens in convulſions: becauſe the operation of a muſcle is the collection of the part which it moves towards its originall. The action of a muſcle.

Therefore ſeeing ſuch a motion or collection appears not any where in the eye-lid, I think it therefore manifeſt that all the motion of this upper eye-lid depends upon this broad muſcle, and that it alone is the author of the motion thereof.

The originall of this broad muſcle is from the upper part of the *Sternon*, the clavicles, the ſhoulder blades, and all the ſpines of the *vertebra's* of the neck: but it is inſerted into all theſe parts of the head which want hair, and the whole face, having divers fibers from ſo various an originall, by benefit of which it performs ſuch manifold motions in the face (for it ſo ſpreads it ſelf over the face, that it covers it like a vizard) by reaſon of the variety of the original and the production of the divers fibers of this muſcle. But I have not in the deſcription of this muſcle proſecuted thoſe nine conditions, which in the firſt book of my Anatomy I required in every part, becauſe I may ſeem to have ſufficiently declared them in the deſcription of the muſcles of the *Epigaſtrium*. Wherefore hence forward you muſt expect nothing from me in the deſcription of muſcles beſides their original, inſertion, action, compoſition, and the deſignation of their veſſels. The originall of the broad muſcle. The inſertion and reaſon why we expreſſe ſo many motions with the face.

CHAP. IV.

Of the Eye-lids and Eye-browes.

BEcauſe we have faln into mention of the eye-lids, and eye-browes, and becauſe the order of diſſection alſo requires it, we muſt tell you what they are, of what they conſiſt, and how and for what uſe they were framed by nature. Therefore the eye-browes are nothing elſe, than a rank of hairs ſet in a ſemi-circular form upon the upper part of the orb of the eye, from the greater to the leſſer corner thereof, to ſerve for an ornament of the body, and a defence of the eyes againſt the acrimony of the ſweat falling from the forehead. What the eye-browes are. Their uſe.

But the ey-lids on each ſide two, one above and another below, are nothing elſe than as it were certain ſhuttings appointed and made to cloſe and open the eyes when need requires, and to contain them in their orbs. Their compoſure is of a muſculous skin, a griſtle and hairs ſet like a pale at the ſides of them to preſerve the eyes when they are open, chiefly againſt the injuries of ſmall bodies, as motes, duſt and ſuch like. Theſe hairs are alwaies of equall and like bigneſſe, implanted at the edges of the griſtly part, that they might alwaies ſtand ſtreight and ſtiffe out. They are not thick, for ſo they ſhould darken the eye. The griſtle in which they are faſtned is encompaſſed with the *pericranium* ſtretched ſo far before it produce the *Conjunctiva*. It was placed there, that when any part thereof, ſhould be drawn upwards or downwards by the force of the broad muſcle or of the two proper muſcles, it might follow entirely and wholly by reaſon of its hardneſſe. They call this ſame griſtle, eſpecially the upper, *Tarſus*. The upper and lower eye-lid differ in nothing, but that the upper hath a more manifeſt motion, and the lower a more obſcure: for otherwiſe nature ſhould have in vain encompaſſed it with a muſculous ſubſtance. What the eye-lids are. Their compoſure and uſes. What the *Tarſus* is.

CHAP. V.

Of the Eyes.

THE Eyes are the inſtruments of the faculty of ſeeing, brought thither by the viſive ſpirit of the optick nerves, as in an aqua-duct. They are of a ſoft ſubſtance, of a large quantity, being bigger or leſſer according to the bigneſſe of the body. They are ſeated in the head, that they might overlook the reſt of the body, to perceive and ſhun ſuch things as might endanger, or endamage the body; for the action of the eyes is moſt quick, as that which is performed in a moment, which is granted to none of the other ſenſes. Wherefore this is the moſt excellent ſenſe of them all. For by this we behold the fabrick and beauty of the heavens and earth, diſtinguiſh the infinite varieties of colours, we perceive and know the magnitude, figure, number, proportion, ſite, motion and reſt of all bodies. The eyes have a pyramidall figure whoſe baſis is without, but the Cone or point within at the optick nerves. Nature would have them contained in a hollow circle, that ſo by the profundity and ſolidity of the place they might be free from the incurſions of bruiſing and hurtfull things. What the eyes are. Their ſite. The quickneſs and excellency of their action. Figure.

They are compoſed of ſix muſcles, five coats, three humours, and a moſt bright ſpirit, (of which there is a perpetual afflux from the brain) two nerves, a double vein, and one artery, Compoſition.

Glandula Lachrymalis. tery, beſides much fat, and laſtly, a Glandule ſeated at the greater angle thereof, upon that large hole which on both ſides goes to the noſe, and that, leſt that the humors falling from the brain ſhould flow by the noſe into the eyes, as we ſee it fares with thoſe whoſe eyes perpetually weep, or water, by reaſon of the eating away of this glandule, whence that affect is called, the *Fiſtula lachrymalis*, or weeping Fiſtula.

Fiſtula Lachrymalis.

Why fat is placed about the eyes.

But there is much fat put between the muſcles of the eye, partly that the motion of the eyes might be more quick, in that ſlipperineſſe of the fat, as alſo that the temper and complexion of the eyes, and chiefly of their nervous parts, might be more conſtant and laſting, which otherwiſe by their continuall and perpetuall motion would be ſubject to exceſſive dryneſſe. For nature, for the ſame reaſon hath placed Glandules flowing with a certain moiſture, neer thoſe parts which have perpetuall agitation.

CHAP. VI.

Of the Muſcles, Coats and humors of the Eye.

The number, ſite and action of the muſcles.

THere are ſix muſcles in the eye, of which four perform the four direct motions of the eye: they ariſe from the bottom of the orb, and end in the midſt of the eye encompaſſing the optick nerve. When they are all moved with one endevour, they draw the eye inwards. But if the upper only uſe its action, it draws the eye upwards; if the lower, downwards; if the right, to the right ſide; if the left, to the left ſide.

The two other muſcles turn the eye about; the firſt of which being the longer and ſlenderer, ariſes almoſt from the ſame place, from which that muſcle ariſes, which draws the eye to the right ſide to the greater corner. But when it comes to the utmoſt part of the inner angle, where the *Glandula lachrymalis* is ſeated, it ends in a ſlender Tendon, there piercing through the middle membrane which is there, as through a ring; from whence it preſently going back is ſpent in a right angle towards the upper part of the eye, betwixt the inſertions of thoſe two muſcles, of the which one draws the eye upwards, the other directly to the outward corner, as it is obſerved by *Falloppius*, or rather, which I remember I have alwaies obſerved, they turn between the muſcles which move the eye upwards, and to the inner corner.

This fifth muſcle when it is drawn in towards its beginning, ſo draws the eye with its circular tendon, that it carries it to the greater corner.

The ſixt muſcle is contrary to that; for it hath its originall from the lower part of the orb at a ſmall hole, by which a nerve of the third conjugation paſſes forth; and being that it is moſt ſlender, whilſt it aſcends tranſverſly to the outward corner, it involves the eye ſo alſo, that it is inſerted in it by a ſmall Tendon, ſo that the Tendons of them both are oftentimes taken but for one. That thou mayſt truly and accurately obſerve this anatomicall deſcription of the eye; the eye muſt not be pluckt out of its orb, but rather the orb it ſelf muſt be broken and ſeparated.

For thus thou ſhalt certainly and plainly ſee the forementioned original of the muſcles.

The 5 coats of the eye.

For the five coats, the firſt which is firſt met with in diſſection, comes from the *Pericranium*, and is extended over all the white of the eye, even to the *Iris* or Rain-bow. The duty of it is to ſtrengthen, bind and contain the eye in its orb, wherefore it had the name *Conjunctiva*, others called it *Adnata*, or *Epipephyces*.

1 *Conjunctiva*, or *Adnata.*

The ſecond is called the *Cornea*, becauſe it reſembles a horn in colour and conſiſtence; this coat differs and varies from it ſelf, for in the forepart, as far as the *Iris* goes, it is clear and perſpicuous, but thick and obſcure in the hind part, by reaſon of the diverſe poliſhing. On the fore-part it is denſe, that it may preſerve and contain the Cryſtalline and wateriſh humor, but withall tranſparent, ſo to give the object a freer paſſage to the Cryſtalline. It hath its originall from the *Craſſa meninx*, proceeding forth from the inner holes of the orb of the eye, for it compaſſes the eye on every ſide.

2 *Cornea*, or the Horny coat.

The third is called the *Vvea* or Grapy coat, becauſe in the exterior part it repreſents the colour of a black grape; it ariſes from the *Pia mater*, and encompaſſes all the eye, except the *pupilla* or apple of the eye, for here being perforated, it adheres to the horny coat by the veins and arteries which it communicates to it for life and nouriſhment. But when it arrives at the *Iris*, then forſaking the *Cornea*, it deſcends deep into the eye, and in ſome ſort is turned about the Cryſtalline humour, to which alſo it moſt firmly adheres, ſo bounding the wateriſh humour, and alſo prohibiting that the Albugineous humor do not overwhelm the Cryſtalline.

3 *Vvea*, or the grapy coat.

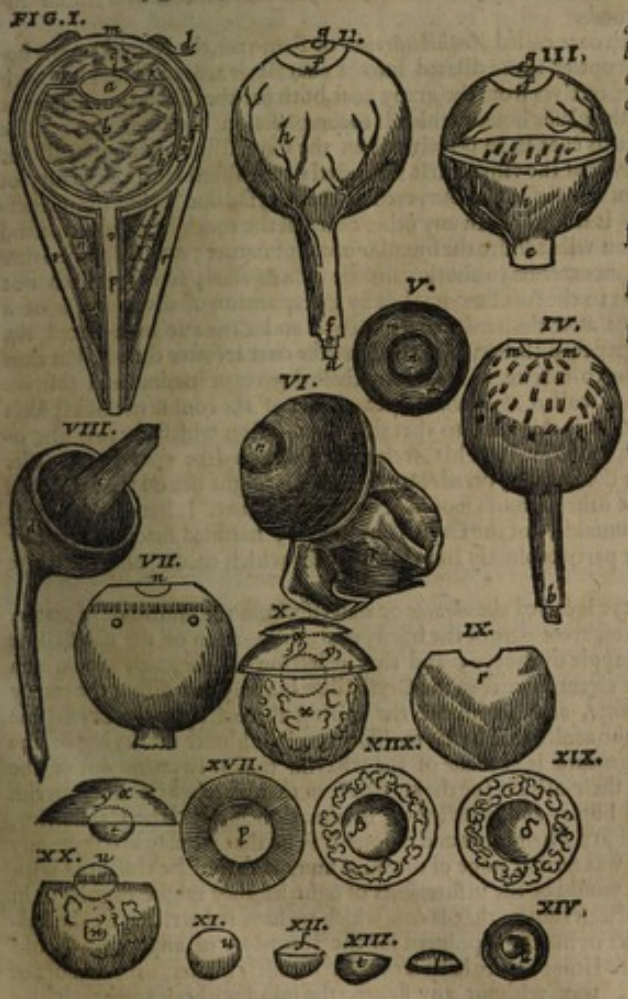
Why the grapy coat reſtembles divers colours.

This grapy coat is as it were dyed on the inſide with divers colours, as black, brown, blew, or green like a rain-bow, and that for theſe enſuing benefits.

The firſt is, if that it had been tinctured with one colour, all objects would have appeared of the ſame colour, as it comes to paſſe when we look through green or red glaſſe. But it muſt be coloured, that ſo it may collect the ſpirits diſſipated by the Sun and ſeeing.

Table 3. *figure* 1. *ſheweth the Membranes and humors of the eye by lines drawn after the manner of a true eye.*
Figure 2. *ſheweth the horny coat with a portion of the Optick Nerve.*
Fig. 3. *ſheweth the ſame divided by a tranſverſe ſection.*
Fig. 4. *ſheweth the* Uvea *or Grapy coat with a portion of the Optick Nerve.*
Fig. 5. *The Grapy coat of a mans eye.*
Fig. 6. *The Horny, Grapy and the Choroides.*
Fig. 7. *The interiour ſuperficies of the Grapy coat.*
Fig. 8. *The poſteriour part of the horny coat together with the ſaid Net coat ſeparated from the Eye.*
Fig. 9. *The coat of the vitreous or glaſſy humor called Hyaloides.*
Fig. 10. *Three humours joined together.*
Fig. 11. *The forward part of the Cryſtalline.*
Fig. 12. *The Cryſtalline humour covered yet with his coat.*
Fig. 14. *The Cryſtalline of a mans eye.*
Fig. 15. *His Coat.*
Fig. 16. *The watery humor diſpoſed upon the Cryſtalline round about.*
Fig. 17. *The hairy proceſſes beamingly ſprinkled through the foreſide of the coat of the glaſſy humor.*
Fig. 18. *The foreſide of the glaſſy humor.*
Fig. 19. *The place of the watery humor.*
Fig. 20. *The glaſſy humor containing or comprehending the Cryſtalline.*

The figure of the Eye.



The explication of the first Figure by it ſelfe.

a, The Cryſtalline humor.
b, The Glaſſie humor.
c, The watery humor.
d, The utmoſt coat called *Adnata*.
e, The dark part of the horny Tunicle which is not tranſparent.
f, The Grapy coat called *Vvea*.
g, The Net-like coat called *Retiformis*.
h, The coat of the glaſſy humor cald *Hyaloides*.
i, The coat of the Cryſtalline.
kk, The hairy proceſſes cald *Proceſſus ciliares*.
l, The impreſſion of the Grapy coat where it departeth from the thick coat.
m, The horny coat, a part of the thick coat.
nn, The fat betwixt the Muſcles.
o, The optick Nerve.
p, The *Dura meninx*.
q, The *Pia mater* or thin Meninx.
rr, The Muſcles.

The explication of the other 19. *figures together.*

a 2, 4, 8. The Optick nerve. *b* 2, 4, The thin *Meninx* cloathing the Nerve. *c* 2, 3. The thick *Meninx* cloathing the nerve. *d* 8. the poſterior part of the horny coat. *e* 8. The coat called *Retina* gathered together on an heap. *f* 2, 3. The rain-bow of the eye. *g* 2, 3. The leſſer circle of the eye or the *pupilla*. *h* 2, 3. Veſſels diſperſed through the *Dura meninx*. *i* 3, 6. The grapy coat, but *i*, in the 3. Fig. ſheweth how the veſſels doe join the hard membrane with the grapy coat. *k*. 6. The horny or hard membrane turned over. *ll* 3, 4. Certain fibers and ſtrings of veſſels, whereby the grapy coat is tyed

to

to the horny. *m m* 4, 5. The impreſſion of the grapy coat where it receideth or departeth from the horny coat. *n n* 4, 5, 6, 7. The *pupilla* or apple of the eye. *o o* 7. The Ciliar or hairy proceſſes. *p* 7. The beginning of the grapy coat made of a thin membrane dilated, but *p* in the 17. figure ſheweth the Ciliar proceſſes ſprinkled through the fore part of the glaſſie humor. *r* 9. The boſome or depreſſion of the glaſſie humor receiving the Cryſtalline. *ſ* 12, 15. The bredth of the coat of the Cryſtalline. *t* 12, 13, 14, 16. The poſterior part of the Cryſtalline humor, which is ſphericall or round. *u* 11, 14, 20. The fore part of the ſame Cryſtalline depreſſed. *x* 10, 20. The amplitude of the glaſſie humor. *y* 10, 16, 19. The amplitude of the watry humor. *z* 19. The place where the glaſſie humour is diſtinguiſhed from the watry by the interpoſition of the *Hyaloides* or coat of the glaſſy humor. *α* 10, 16. The place where the grapy coat ſwimmeth in the watry humor. *β* 18. The cavity or depreſſion of the glaſſie humor which remaineth when the Cryſtalline is exempted or taken from it. *δ* 19. the cavity or depreſſion of the watry humor made by the ſame means.

Thirdly, it was convenient it ſhould be painted with infinite variety of colours for the preſervation of the ſight. For as the extream colours corrupt and weaken the ſight, ſo the middle refreſh and preſerve it, more or leſſe as they are neerer, or further remote from the extremes. It was fit it ſhould be ſoft, that ſo it might not hurt the Cryſtalline humor upon whoſe circumference it ends; and perforated in the part objected to it, leſt by its obſcurity it ſhould hinder the paſſage of the objects to the Cryſtalline, but rather that it might collect by its blackneſſe as a contrary, the great and as it were diffuſed variety of colours, no otherwiſe than we ſee the heat is ſtrengthned, by the oppoſition of cold; ſome call this coat *Choroides*, becauſe it is woven with many veins and arteries, like the coat *Chorion* which involves the infant in the womb.

Amphibleſtroides or *Retiformis*, Net-like coat.

Now followes the fourth coat called *Amphibleſtroides* or *Retiformis*, the Net-like coat, becauſe proceeding from the optick nerve dilated into a coat, it is woven like a net with veins and arteries which it receives from the grapy coat, both for the life and nouriſhment both of it ſelf, as alſo of the glaſſie humor which it encompaſſes on the back part. The principall commodity of this coat is, to perceive when the Cryſtalline humor ſhall be changed by objects, and to lead the viſive ſpirit inſtructed or furniſhed with the faculty of ſeeing, by the mediation of the glaſſie humour, even to the Cryſtalline being the principall inſtrument of ſeeing. It is ſofter than any other coat, leſt the touch of it ſhould offend that humor. Wherein thou wilt admire the ſingular order of nature, which as in other things it paſſes not from one extreme to another unleſſe by a *Medium*, ſo here it hath not fitted the hard horny coat to the ſoft humors, but by interpoſition of divers *media* of a middle conſiſtence. For thus after the harder coats *Adnata* and *Cornea* it hath placed the grapy coat, by ſo much ſofter then theſe two, as the Net-like coat is ſofter then it, that thus it might paſſe from extreme to extreme as it were by theſe degrees of hardnes and ſoftnes.

An Anatomicall Axiome.

5 *Arachnoides, ſive Aranceoſa*, the Cobweb-coat.

The fifth and laſt coat is called *Arachnoides*, becauſe it is of the conſiſtence of a ſpiders web. And we may well reſemble this coat, to that skin of an union which exceeds the other in clearneſs, whiteneſs, and thinneſs. This *Aranceoſa* or Cobweb-like coat encompaſſes the Cryſtalline humor on the fore ſide, peradventure that ſo it might defend it, as the chief inſtrument of ſeeing, if the other humors ſhould at any time be hurt. It hath its originall from the excrementitious humidity of the Cryſtalline humor, hardned into that coat by the coldnes of the adjacent part; abſolutely like the thin skin which encompaſſes the white of an Egg.

The 3 humors of the eye.

1 *Aqueus*, or watery.

The firſt humor of the eye is called the *Aqueus* or wateriſh, from the ſimilitude of water; it is ſeated between the tranſparent part of the horny coat, the portion of the Cryſtalline humor lying towards the apple of the eye, and that reflection of the grapy coat which comes from the *Iris* to the circumference of the Cryſtalline humor, that filling the empty ſpace it may diſtend the *Cornea*, and ſo hinder the falling thereof upon the Cryſtalline which would ſpoil the ſight; as alſo that by its moiſture it might hinder the drying of the Cryſtalline humor. Peradventure it is made of the whayiſh humor ſweating out of the veſſels of the coats, having their orifices for the moſt part in that place, where this wateriſh humor reſides. The ſecond humor and middlemoſt in ſituation is called the Cryſtalline, becauſe it imitates Cryſtall in the brightnes and colour; if ſo be that we may attribute any colour to it. For indeed it was fit that none of the three humors ſhould be tinctured with any colour, as thoſe which would be the inſtruments of ſight, leſt they might beguile us in ſeeing, as red and green ſpectacles do; for that is true which we have red written by the Philoſophers; That the ſubject or matter appointed for the reception of any form ſhould want all impreſſion thereof. Hence nature hath created a formleſs matter, the humors of the eyes without colours, wax without any figure, the mind without any particular knowledg of any thing, that ſo they might be able to receive all manner of forms. The figure of the Cryſtalline humor is round, yet ſomewhat flatted on the foreſide, but yet more flatted behind, that ſo the objects might be the better retained in that, as it were, plane figure, and that they might not fly back as from a Globe, or round body, in which they could make but ſhort ſtay; leſt it might be eaſily moved from its place by the force of any

2 *Cryſtallinus*, *Cryſtalline*.

A Philoſophicall Axiome.

thing

thing falling or hitting againſt it, becauſe that body which is exactly round touches not a plane body but only in a point or prick. Half this humor ſwims in the glaſſie humor, that ſo it may be nouriſhed from it by tranſpoſition of matter; or rather (ſeeing it is encompaſſed on every ſide with the fift coat, that the matter cannot eaſily be ſent from the one into the other) by the benefit of the veſſels produced even unto it as well by the Net-like coat as by the Grapy, but it is filled with a bright ſpirit on the forepart, which lyes next to the wateriſh humor, and the ſpace of the Apple of the eye.

Of which thing this is an argument, that as long as a man remains alive, we ſee the eye every way full, and ſwoln, but lank and wrinkled when he is dead; beſides alſo one of the eyes being ſhut, the *Pupilla* of the other is dilated by the ſpirit compelled to fly thither. And alſo for the ſame cauſe the horny coat is wrinkled in very old men, and the *Pupilla* is ſtraitned by the wrinkles ſubſiding into themſelves, which is the cauſe that they ſee little, or not at all; for by age and ſucceſs of time the humor is conſumed by little and little, the implanted ſpirit vaniſhes away, and ſmaller quantity of ſpirits flow from the brain, as from a fountain which is alſo exhauſted. The horny coat at his original, that is, in the parts next the *Iris*, ſeemeth to be very nigh the Cryſtalline humor, becauſe all the coats in that place mutually cohere as touching one another, but as it runs further out to the *Pupilla*, ſo it is further diſtant from the Cryſtalline. Which you may eaſily perceive by Anatomicall diſſection, and the operation of touching or taking away a Catarrhact: for whereas a Catarrhact is ſeated between the horny coat, and Cryſtalline humor, the needle thruſt in, is carried about upwards, downwards, and on every ſide through a large and free ſpace, neither touching the horny coat nor Cryſtalline humour, by reaſon theſe bodies are ſevered by a good diſtance filled with ſpirit and a thin humour. The uſe of it is, that it may be like a looking-glaſſe to the faculty of ſeeing carried thither with the viſive ſpirit.

Gal. Cap 5. Lib 10. de uſu part.

In what place Catarrhact or ſuffuſion breeds.

The third and laſt humor is the *Vitreus* the glaſſie, or rather Albugineous humor, called ſo, becauſe it is like molten glaſſe, or the white of an Egg. It is ſeated in the hind part of the Cryſtalline humor, that ſo it may in ſome ſort break the violence of the ſpirit flowing from the brain into the Cryſtalline humour, no otherwiſe than the watry humor is placed on the foreſide of the Cryſtalline to hinder the violence of the light and colours entring that way. This glaſſie humor is nouriſhed by the Net-like coat.

3 *Vitreus ſeu Albugineus*, that is Glaſſie or like the white of an Egg.

We have formerly ſpoken ſufficiently of the nerves of the eye: Wherefore it remains that we ſpeak of the veins. Some of theſe are internall, carried thither with the coats of the veſſels of the brain; other ſome externall, ſtretched over the externall parts of the eye, as the Muſcles, and coat *Adnata*; and by theſe veins inflammations and redneſs often happen in the externall parts of the eye: for which the *Vena pupis* muſt be opened, and cupping glaſſes and horns muſt be applyed to the nape of the neck and ſhoulders: as in the internall inflammations of the eye, the cephalik vein muſt be opened to avert and evacuate the morbifick humor.

The veins of the eye.

What veins may be opened in what inflammations of the eyes.

CHAP. VII.

Of the Noſe.

THe Noſe is called in Greek *Ris*, becauſe the excrements of the Brain flow forth by this paſſage, thou maiſt underſtand it hath a divers ſubſtance by compoſition. The quantity, figure and ſite are ſufficiently known to all. But it is compoſed of the skin and muſcles, bones, griſtles, a membrane or coat nerves, veins and arteries. The skin and bones both contained and containing, have formerly been explained, as alſo the nerves, veins and arteries. The griſtles of the Noſe are ſix in number; the firſt is double, ſeparating both the noſtrills in the top of the noſe extended even to the bone *Ethmoides*. The ſecond lyes under the former. The third and fourth are continued to the two outward bones of the noſe. The fifth and ſixth being very ſlender and deſcending on both ſides of the noſe, make the wings or moveable parts thereof. Therefore the uſe of theſe griſtles is, that the noſe moveable about the end thereof, ſhould be leſſe obnoxious to externall injuries, as fractures and bruiſes, and beſides more fit for drawing the air in and expelling it forth in breathing. For nature for this purpoſe hath beſtowed four muſcles upon the noſe, on each ſide two, one within, and another without.

The Griſtles of the noſe.

The External taketh its original from the cheek, and deſcending obliquely from thence, and after ſome ſort annexed to that which opens the upper lip, is terminated into the wing of the noſe, which it dilates.

The muſcles thereof.

The internall going on the inner ſide from the jaw-bone, ends at the beginning of the griſtles that make the wings, that ſo it may contract them. The coat which inwardly inveſts the noſtrils and their paſſages, it produced by the five-like bones from the *Craſſa meninx*, as the inner coat of the palat, throttle, weazon, gullet and inner ventricle, that it is no mervail, if the affects of ſuch parts be quickly communicated with the brain. This ſame coat on each ſide receives a portion of a nerve from the third conjut-

conjugation, through the hole which deſcends to the noſe by the great corner of the eye.

The temper, action and uſe.

The noſe in al the parts thereof is of a cold and dry temper. The Action and profit thereof is to carry the air and oft-times ſmells to the mamillary proceſſes, and from thence to the four ventricles of the brain, for the reaſons formerly ſhewed. But becauſe the mamillary proceſſes being the paſſages of the air and ſmels are double, and for that one of theſe may be obſtructed without the other, therefore nature hath alſo diſtinguiſhed the paſſage of the noſe with a griſtly partition put between, that when the one is obſtructed, the air by the other may enter into the brain for the generation and preſervation of the animall ſpirit. The two holes of the noſe firſt aſcend upwards, and then downwards into the mouth, by a crooked paſſage, leſt the cold air, or duſt ſhould be carried into the lungs.

Why the noſe was parted in two.

But the noſe was parted into two paſſages as we ſee, not only for the forementioned cauſe, but alſo for helping the reſpiration and vindicating the ſmell from externall injuries; and laſtly, for the ornament of the face.

CHAP. VIII.

Of the Muſcles of the Face.

Their number.

NOw we muſt deſcribe the muſcles of the face pertaining as well to the lips as to the lower jaw. Theſe are 18. in number, on each ſide nine, that is, four of the lips, two of the upper, and as many of the lower. But there belong five to the lower jaw. The firſt of the upper lip being the longer, and narrower, ariſing from the yoak-bone deſcends by the corner of the mouth to the lower lip, that ſo it may bring it to the upper lip, and by that means ſhut the mouth. The other being ſhorter and broader, paſſing forth of the hollowneſs of the cheek, or upper jaw (by which a portion of the nerves of the third conjugation deſcends to theſe two muſcles, and other parts of the face) ends in the upper part of the ſame upper lip, which it compoſes together with the fleſhy pannicle and skin, and it opens it by turning up the exterior fibers towards the noſe, and ſhuts it by drawing the internall inwards towards the teeth.

The firſt of the lower lip being the longer and ſlenderer, entring out of that region which is betwcen the externall perforation of the upper jaw (through which on the inner part of the ſame, a nerve paſſeth forth to the ſame muſcles) and the muſcle *Maſſeter*, (of which hereafter) then aſcending upwards by the corner of the the mouth, it ends in the upper lip, that ſo it may draw it to the lower.

The other broader and ſhorter begins at the lower part of the chin, and the hollowneſs thereof, and ends at the lower lip which it makes, opening it within and without by its internall and externall fibers, as we alſo ſaid of its oppoſite. And that I may ſpeak in a word, nature hath framed three ſorts of muſcles for the motion of the mouth, of which ſome open the mouth, others ſhut it, and otherſome wreſt it and draw it awry; but you muſt note that when the muſcles of one kind jointly perform their functions (as the two upper which we deſcribed in the firſt place, on each ſide one, which draw the lower lip to the upper, and the muſcles oppoſite to them) they make a right or ſtreight motion; but when either of them moves ſeverally, it moves obliquely, as when we draw our mouth aſide. But theſe muſcles are ſo faſtned and fixed to the skin, that they cannot be ſeparated; ſo that it is no great matter whether you call it a muſculous skin, or a skinny muſcle: (Which alſo takes place in the palms of the hands and ſoles of the feet) but theſe muſcles move the lips the upper jaw being not moved at all.

CHAP. IX.

Of the Muſcles of the lower Jaw.

Their number.

WE have ſaid theſe muſcles are five in number, that is, four which ſhut it, and one which opens it, and theſe are alike on both ſides. The firſt and greater of

The Temporall muſcle.

theſe four muſcles which ſhut the Jaw is called *Crotaphita* or Temporall muſcle; it ariſes from the ſides of the forehead and *Bregma* bones, and adhering to the ſame and the ſtony bone, it deſcends under the yoak-bone, from whence it inſerts it ſelf to the proceſſe of the lower jaw which the Greeks call *Corone*, that it may draw it directly to the upper, ſo to ſhut the mouth.

Why the wounds of the temporall Muſcle are deadly.

But you muſt note, that this muſcle is tendinous even to his belly, and that it fils and makes both the temples. It is more ſubject to deadly wounds than the reſt by reaſon of the multitude of nerves diſperſed over the ſubſtance thereof, which becauſe they are neer their originall, that is, the brain, they infer danger of ſodain death by a convulſion which uſually follows the affects of this muſcle, bnt alſo in like manner it cauſes a Feaver, the Phrenſy and *Coma*.

The

The figure of the chief muſcles of the Face.

FIG. II.

A. *The muſcle of the forehead and the right fibers thereof.*
B. *The Temporall muſcle.*
α. β. γ. *his ſemicircular originall.*
D. *The muſcle of the upper lip.*
G. *The yoak-bone under which the temporall muſcles paſſe.*
I. *The Maſſeter, or Grinding muſcle.*
K. *The upper griſtle of the noſe.*
M. *A muſcle forming the cheeks.*
N. *The muſcle of the lower lip.*
O. *A part of the fifth muſcle of the lower Iaw called* Digaſtricus, *that is, double bellied.*
Q. R. *The firſt muſcle of the bone* Hyoides *growing unto the rough Artery.*
S. *The ſecond muſcle of the bone* Hyoides *under the Chin.*
T. *The third muſcle of the bone* Hyoides *ſtretched to the Jaw.*
T. K. *The ſeventh muſcle of the head and his inſertion at* T.
V. V. *The two venters of the fourth muſcle of the bone* Hyoides.
φ. *The place where the veſſels paſſe which go to the head, and the nerves which are ſent to the Arm.*

Therefore that it ſhould be leſſe ſubject or obvious to externall injuries, Nature hath, as it were, made it a retiring place in the bone, and fortified it with a wall of bone raiſed ſomewhat higher about it. The other Muſcle almoſt equall to the former in bigneſs, being called the *Maſſeter*, or grinding muſcle, makes the Cheek; it deſcends from the loweſt part of the greateſt bone of the orb (which bends it ſelf as it were back, that it may make part of the yoak-bone) and inſerts it ſelf into the lower Jaw, from the corner thereof to the end of the root of the proceſſe *Corone*, that ſo it may draw this Jaw forward and backward, and move it like a hand-mill. The *Maſſeter* or grinding muſcle.

Wherefore nature hath compoſed it of two ſorts of fibers, of the which ſome from the neck (the cheek in that place under the eyes ſtanding ſomewhat out like an apple ariſing from the concourſe of the greater bones of the orb and upper jaw) deſcend obliquely to the corner and hinder part of the lower jaw, that it may move it forwards. Otherſome ariſe from the lower part of the ſame yoak-bone, and deſcending obliquely interſect the former fibers after the ſimilitude of the letter X, and inſert themſelves into the ſame lower jaw at the roots of the proceſſe *Corone*, that ſo they may draw it back: Truely by reaſon of theſe contrary motions it is likely this muſcle was called the *Maſſeter* or grinder.

The third, which is the round muſcle, ariſes from all the Gums of the upper jaw, and is inſerted into all the gums of the lower, inveſting the ſides of all the mouth with the coat, with which it is covered on the inſide, being otherwiſe covered on the outſide with more fat than any other muſcle. The action thereof is, not only to draw the lower Jaw to the upper, but alſo as with a ſhovell to bring the meat diſperſed over all the mouth under the teeth, no otherwiſe then the tongue draws it in. The round muſcle.

The fourth being ſhorter and leſſe than the reſt ariſing from all the hollowneſs of the winged proceſſe of the Wedge-bone, is inſerted within into the broadeſt part of the lower Jaw, that ſo in like manner it may draw the ſame to the upper. This is the muſcle through whoſe occaſion, we ſaid this lower Jaw is ſometimes diſlocated. The leſſer muſcle of the lower Iaw.

The figure of the Muſcles of the lower Jaw.

FIG. III.

A. *A hole in the forehead bone in the brim of the ſeat of the eye, ſending a ſmall nerve of the third pair to the muſcles of the forehead and the upper eye-brow.*
B. *The Temporall muſcle.*

The fifth and laſt muſcle of the lower jaw from the proceſſe *ſtyloides* of the ſtony bone, aſcends to the forepart of the Chin, neer to the connexion of the two bones of this jaw, The 5ſt and laſt muſcle.

to draw this Jaw downwards from the upper in opening the mouth. This muſcle is ſlender and tendinous in the midſt, that ſo it might be the ſtronger, but it is fleſhy at the ends. All theſe muſcles were made by the ſingular providence of nature, and engraffed into this part for the performance of many uſes and actions, as biting aſunder, chawing, grinding and ſevering the meat into ſmall particles, which the tongue by a various and harmleſs motion puts under the teeth. Thus much I thought good to ſay of the parts of the face, as well containing as contained.

The uſe of theſe mentioned muſcles.

CHAP. X.

Of the Ears and Parotides *or kernels of the Ears.*

The nature and compoſition of the ears. What the *Fibra* and *pinna* are. The figure and the reaſon thereof.

THe Ears are the Organs of the ſenſe of hearing. They are compoſed of the skin, a little fleſh, a griſtle, veins, arteries and nerves. They may be bended or folded in without harm, becauſe being griſtly, they eaſily yeeld and give way; but they would not do ſo, if they ſhould be bony, but would rather break. That lap at which they hang pendants and Jewels, is by the ancients called *Fibra*, but the upper part *pinna*. They have been framed by the providence of nature into two twining paſſages like a Snails ſhell, which as they come neerer to the *foramen cæcum* or blind hole, are the more ſtraitned, that ſo they might the better gather the air into them, and conceive the differences of ſounds and voices, and by little and little lead them to the membrane.

The Figure of the ears and bones of the auditory paſſage.

Tab. 10. *ſheweth the ears and the divers internall parts thereof.*

Fig. 1. *ſheweth the whole externall ear, with a part of the Temple bone.*

Fig. 2. *ſheweth the left bone of the Temple divided in the midſt by the inſtrument of hearing, whereabout on either ſide there are certain paſſages here particularly deſcribed.*

Fig. 3, *and* 4. *ſheweth the three little Bones.*

Fig. 5. *ſheweth a portion of the bone of the temples which is ſeen neer the hole of Hearing divided through the midſt, whereby the Nerves, Bones and Membranes may appear, as* Veſalius *of them conceiveth.*

Fig. 6. *ſheweth the Veſſels, Membranes, Bones and holes of the Organ of hearing, as* Platerus *hath deſcribed them.*

Fig. 7, *and* 8. *ſheweth the little bones of the hearing of a man and of a Calfe, both joined and ſeparated.*

Fig. 9. *ſheweth the Muſcle found out by Aquapendens.*

For the particular declaration ſee *D. Crooks* Anatomy. pag. 577.

This membrane which is indifferently hard hath grown up from the nerves of the fifth

fifth conjugation, which they call the auditory. But they were made thus into crooked windings, leſt the ſounds ruſhing in too violently ſhould hurt the ſenſe of hearing. Yet for all this we oft find it troubled and hurt by the noiſe of thunder, Guns and Bels. Otherwiſe alſo leſt that the air too ſodainly entring in ſhould by its qualities, as cold, cauſe ſome harm: and alſo that little creeping things and other extraneous bodies, as fleas and the like, ſhould be ſtayed in theſe windings and turnings of the waies, the glutinous thickneſs of the cholerick excrement or ear-wax hereunto alſo conducing, which the brain purges and ſends forth into this part, that is, the auditory paſſage framed into theſe intricate Mæanders.

For what uſe the ear wax ſerves.

But that we may underſtand how the hearing is made, we muſt know the ſtructure of the organ or inſtrument hereof. The membrane which we formerly mentioned to conſiſt of the auditory nerve, is ſtretched in the inſide over the auditory paſſage like as the head of a Drum. For it is ſtretched and extended with the air, or auditory ſpirit implanted there, and ſhut up in the cavity of the mamillary proceſſe and *foramen cecum*, that ſmitten upon by the touch of the externall air entring in, it may receive the object, that is, the ſound, which is nothing elſe then a certain quality ariſing from the air beaten or moved by the colliſion and conflict of one or more bodies.

For what uſe the membrane ſtretched under the auditory paſſage ſerves.

What ſound is.

Such a colliſion is ſpred over the air, as the water which by the gliding touch of a ſtone produces many circles and rings one as it were riſing from another. So in rivelets running in a narrow channel, the water ſtrucken, and as it were, beaten back in its courſe againſt broken, craggy and ſteep rocks, wheels about into many turnings: this colliſion of the beaten air flying back divers waies from arched and hollow roofed places, as Dens, Ciſterns, Wells, thick Woods and the like, yeelds and produces a double ſound, and this reduplication is called an Echo. Wherefore the hearing is thus made by the air, as a medium, but this air is twofold, that is, externall and internall.

The cauſe of an echo.

The exteriour is that which encompaſſes us, but the interiour is that which is ſhut up in the cavity of the mamillary proceſſe and *foramen cecum*, which truly is not pure and ſole air, but tempered and mixed with the auditory ſpirit. Thence proceeds the noiſe or beating of the ears, when vapors are there mixed with the air inſtead of ſpirits, whereby their motion is perturbed and confuſed. But neither do theſe ſuffice for hearing, for nature for the more exact diſtinction of ſounds hath alſo made the little bones, of which one is called the *Incus* or anvill, another the *Malleolus* or hammer, the third the *Stapes* or ſtirrop, becauſe the ſhape thereof reſembles a German ſtirrop. Alſo it may be called *Deltoides*, becauſe it is made in the ſhape of the Greek letter Δ.

The 3 bones of the auditory paſſage.

They are placed behind the membrane; wherefore the anvill and hammer moved by the force of the entrance of the externall air, and beating thereof againſt that membrane, they more diſtinctly expreſſe the difference of ſounds, as ſtrings ſtretched within under the head of a Drum; as for example, theſe bones being more gently moved repreſent a low ſound to the common ſenſe and faculty of hearing, but being moved more vehemently and violently, they preſent a quick and great ſound; to conclude, according to their divers agitation, they produce divers and different ſounds.

Their uſes.

Whence the difference of ſounds.

The Glandules ſhould follow the Ears in the order of Anatomy, as well thoſe which are called the emunctories of the brain, that is, the *Parotides*, (which are placed as it were at the lower part of the ears) as theſe which lye under the lower Jaw, the muſcles of the bone *Hyoides* and the tongue, in which the *Scrophulæ* and other ſuch cold abſceſſes breed. It ſhall here ſuffice to ſet down the uſe of all ſuch like Glandules.

Therefore the *Parotides* are framed in that place by nature, to receive the virulent and malign matter ſent forth by the ſtrength of the brain, by the veins and arteries ſpred over that place. The reſt ſerve to ſtrengthen the diviſion of the veſſels, to moiſten the ligaments and membranes of the Jaw, leſt they ſhould be dryed by their continuall motion. Their other conditions and uſes are formerly handled in our firſt book of Anatomy.

CHAP. XI.

Of the bone Hyoides, *and the Muſcles thereof.*

THe ſubſtance of the bone *Hyoides* is the ſame with that of other bones. The figure thereof imitates the greek letter υ from whence it took the name, (as alſo the name ὑψιλοειδὴς; and from the letter λ it is in like ſort called λαμβδοειδὴς; by ſome it is ſtiled *os Gutturis* and *os Linguæ*, that is, the Throat-bone and Tongue bone. The compoſition thereof conſiſts of many bones joined into one by the interpoſition of griſtles.

The reaſon of the name.

The compoſition.

This bone is bigger in beaſts and compoſed of more bones, and that not only by the intercourſe of griſtles, but alſo of ligaments. It is ſeated with its baſis (being gibbous on the

The ſite.

forepart for conſtancy, and arched on the inſide that it might receive and contain the root of the tongue) upon the upper part of that griſtle of the throtle which is called *ſcutiformis* or Shield-like, (for this ſeems to prop it up by the ſtrength of two proceſſes riſing at the baſis thereof) and the root of the tongue. From this baſis it ſends forth two horns to the ſides of the tongue on each ſide one, which in men are tyed to the Appendix *ſtyloides* by ligaments ſent from it ſelf. Contrary then it is in beaſts, who have it of many bones united as we ſaid, by the intercouſe of ligaments even to the root of the *ſtyloides*. Wherefore this bone hath connexion with the forementioned parts, and other hereafter to be mentioned. It hath the ſame temper ac other bones have. The uſe of it is, to miniſter ligaments to certain muſcles of the tongue, and inſertion as well to the two foremoſt and upper muſcles of the throtle, as to its own, of which we will now treat.

The temper and uſe.

The muſcles of the bone *Hyoides*, according to the opinion of ſome are eight, on each ſide four; of which there be two, one of which *Galen* refers to the common muſcles of the *larinx* or throtle; and the other to thoſe which move the ſhoulder-blade upwards. Howſoever it be, the firſt of the four before mentioned ariſes from the Appendix *Styloides*, and paſſing over the nervous ſubſtance of the muſcle opening the lower jaw, is inſerted into the horns of the bone *Hyoides*. This muſcle is very thin, yet ſomewhat broad, the which in that reſpect may eaſily be cut, unleſſe you have a care in ſeparating the muſcle which opens the lower Chap. The ſecond aſcends obliquely from the upper part of the ſhoulder-blade neer the production thereof called *Coracoides*, to the beginnings of the horns of the ſaid bone *Hyoides*. This is round and nervous in the midſt that ſo it might be the ſtronger, as that is which we formerly ſaid opens the lower jaw; and it is refer'd by *Galen* amongſt thoſe which move the ſhoulder-blade upwards. The third ariſes from the upper part of the *ſternon*, and is inſerted at the root and baſis of the bone *Hyoides*; yet *Galen* refers it to the common muſcles of the *Larinx*; whoſe opinion takes place rather in beaſts, than in man, ſeeing in man this muſcle cannot be found either to proceed, or be inſerted into the throtle, as it is in beaſts. The fourth and laſt deſcends within from the chin to the root of the bone *Hyoides*. The firſt of theſe muſcles with its companion or partner moves the bone *Hyoides* upwards, the ſecond downwards; the third backwards; and the fourth forwards. I would declare whence theſe muſcles have their veſſels, had I not abundantly ſatisfied that thing, when I treated of the diſtribution of the nerves, veins and arteries.

The muſcles of the bone *Hyoides*.

The action of theſe muſcles.

CHAP. XII.

Of the Tongue.

What kind of fleſh the tongue hath.

THE tongue is of a fleſhy, rare, looſe and ſoft ſubſtance; it enjoyes fleſh of a different kind from the reſt of the fleſh, as chiefly appears when you cut it from the firſt originall of the muſcles thereof; which thing hath moved ſome, that they have made a fourth kind of fleſh proper to the tongue and different from the reſt, *viz.* the fibrous, muſculous, and that of the bowells. The quantity thereof is ſuch that it may be contained in the mouth, and eaſily moved to each part thereof. The figure of it is triangular, which it rather expreſſes in the baſis, which is as the root of the bone *Hyoides*, than in its point, or forepart, where from a triangle it becomes more dilated. It is compoſed of a membrane (which it hath from that which lines all the inſide of the mouth) muſcles 4. nerves two on each ſide, the one whereof is ſent from the third conjugation, into the coat thereof; the other from the ſeventh is ſent into the muſculous ſubſtance even to the end thereof for motions ſake; ſo that thoſe ſenſifick nerves from the third conjugation only give to judg of taſtes, compoſe the coat, and touch or enter not the fleſh. Beſides it is compoſed of veins and arteries on each ſide one, which it receives from the externall Jugular and *Carotides*, running manifeſtly to the end thereof on the lower ſide, that ſo they might be eaſily opened in the diſeaſes of the mouth and throtle; they commonly term theſe the *Venæ nigræ* or black veins.

The quantity.

The figure.

Compoſure.

The nerves.

The muſcles of the tongue, are abſolutely ten, on each ſide five. The firſt narrow at the beginning and broader at the end, deſcends into the upper ſide of the tongue from the Appendix *Styloides*, and together with its copartner draws it upwards. The ſecond hath its originall within from the lower jaw, about the region of the grinding-teeth, and is inſerted into the lower ſide of the tongue, the which with its partner draws it downward. The third proceeds from the inner part of the chin, and goes to the root of the tongne, that when need requires it may put it forth of the mouth. The fourth the greateſt and broadeſt of them all, compoſed of all ſorts of fibers, paſſes forth from the baſis of the bone *Hyoides*, and ends at the lower part of the tongue, which with its companion plucks it back into the mouth. The fift and laſt moſt uſually ariſes from the upper part of the horns of the bone *Hyoides*, and goes to the roots of the tongue between the two firſt, that it may move it to the ſides of the mouth.

The muſcles of the tongue.

mouth. The temper thereof, as of all other fleſh, is hot and moiſt. The firſt action and commodity thereof is, to be the organ of the ſenſe of taſting, wherefore it was made ſpungous and ſpongy, that by reaſon of the rarity of it, it might more eaſily admit the taſts conjoyned with the ſpettle, as a vehicle. Another to be an inſtrument to diſtinguiſh the voice by articulate ſpeech, for which it was made movable into each part of the mouth. The third is to be a help to chaw and ſwallow the meat. For which cauſe it is like a ſcoop or diſh with which we throw back the corn into the mill, which hath ſcaped grinding. And becauſe, when the tongue is dry, it is leſs nimble and quick to perform its motions, as appears by thoſe which can ſcarce ſpeak by reaſon of thirſt or a burning Feaver: therefore nature hath placed very ſpongy glandules at the roots thereof, on each ſide one, which like ſponges ſuck and receive, both from the brain and other places, a Wateriſh and ſpettlely humor, with which they humect and make more glib, not only the tongue, but alſo the other parts of the mouth, as the throat and jawes; theſe glandules are called the *Tonſille*, or Almonds of the throat.

The temper, action, and manifold uſe of the tongue.

The uſe of the glandules placed at the roots of the tongue.

CHAP. III.

Of the Mouth.

THE mouth is that capacity which bounded with the cheeks and lips contains within its precincts the teeth, tongue, and the beginnings of the throtle and gullet. Therefore the uſe of the mouth is to contain the tongue, and ſerve it in the fitter performance of its actions; and although many parts hereof have been formerly handled, as the lips, teeth, jawes, tongue, almonds, and paſſages of the palat coming from the noſe, yet it remains, that we declare what the palat, the *Gargareon*, or Vvulva, the *Pharinx*, and *fauces* or Chops are. The Palat (or as it is commonly called, the Roof of the mouth) is nothing elſe but the upper part of the mouth bounded with the teeth gums and upper Jaw. In which place the coat common to the whole mouth, is made rough with divers wrincles, that the meats put up and down between the tongue and the Palat might be broken and chawed more eaſily by that inequality and roughneſs. If any would find the nerves, which deſcend into the palat from the fourth conjugation, let him ſeparate that coat and caſt it from the fore to the hind part of the mouth; for ſo he ſhall find them at the ſides and hind parts of the bones of the Palat, which incompaſs the Palat, and at the beginning of the inner holes of the mouth, which deſcend from the noſe, and region of the productions of the wedgbone called the Saddle. Theſe holes or paſſages are open, that we may breath the better when we ſleep, and that when the noſe is not well, the excrements which ſeek their paſſage by it, may be eaſilier drawn away by the mouth. This ſame coat is woven with nervous fibers, that like the tongue it might judg of taſts; theſe fibers compoſe a coat that hath a middle conſiſtence betwixt ſoft and hard. For if it ſhould have been any harder, like a bone or griſtle, it would have been without ſenſe, but if ſofter, hard, acrid and ſharp meats would have hurt it.

What it is.

The uſe.

What the palat is.

The nerves thereof.

Why the holes of the palat are open.

What kind of coat the palat hath.

CHAP. XIIII.

Of the Gargareon, *or Vvula.*

BY the *Gargareon* we underſtand a fleſhy and ſpongy body, in ſhape like a pine apple, hanging directly down at the further end of the palat and baſis of the bone *Ethmoides*, where the two holes of the palat come from the noſe, above the entrance of the throtle. This little body is ſituate in this place to break the violence of the air drawn in by breathing, and that by delay it might in ſome ſort temper and mitigate it by the warmneſs of the mouth. Beſides, that it might be as it were the *Plectrum*, or quil of the voice, ſo to diffuſe the fuliginous vapour ſent forth in breathing, that it may be diſperſed over all the mouth, that reſounding from thence it may be articulate, and by the motion of the tongue diſtinguiſhed and formed into a certain voice. Which uſe is not ſmall, when we ſee by experience that ſuch as have this particle cut away, or eaten, or corrupted by any accident, have not only their voyce vitiated and depraved, but ſpeak ill-favouredly, and as they ſay, through the noſe; and beſides in proceſs of time they fall into a conſumption by reaſon of the cold air paſſing down before it be qualified. This ſame particle, is alſo a means to hinder the duſt from flying down through the weazon into the Lungs. By the *Pharinx* and *fauces* is meant the inner and back part of the mouth, ſet or placed before the entrance of the Throtle and Gullet; being ſo called, becauſe that place is narrow and ſtrait, that as it were by theſe ſtraits, the air drawn in by the mouth might be forced down by the Throtle, and the meat into the Gullet.

What the *Gargareon*, or Vvula is.

The fite and manifold uſe thereof.

The diſcommodities that enſue the loſs of the Vvula.

What the *Pharinx* and *fauces* are.

CHAP.

CHAP. XV.

Of the Larinx, *or Throttle.*

What is meant by the *Larinx.*

FIrſt we muſt ſhew what is meant by the *Larinx* and Throttle, then proſecute the other conditions of it after our accuſtomed manner. Therefore by the *Larinx* we underſtand nothing elſe in this place, than the head & extremity of the rough artery, or weazon, which comes neerer to griſtly ſubſtance, than to any other. The quantity thereof is ſufficiently large, yet divers according to the diverſity of bodies. It reſembles in ſhape the head of a *Germane* pipe. The compoſure of it conſiſts of 18. muſcles, on each ſide nine, which as they are like in quantity, ſo alſo in ſtrength and action; of three griſtles, veins, arteries and nerves, as we ſhewed, when we ſpoke of the diſtribution of the veſſels; as alſo of a double coat, the one externall, the other internall, as we ſhewed when we ſpoke of the weazon. Theſe three griſtles are joyned together by certain Ligaments and muſcles; the foremoſt griſtle, which alſo is the greater, is called by the Greeks θυρεοειδὴς, in Latin commonly *Scutiformis*, that is ſhield-like, becauſe it reſembles a ſhield. The ſecond being the hinder and middle in magnitude, wants a name, wherefore it is called the *innominata* or nameleſs griſtle. The laſt and leaſt, which notwithſtanding may be parted into two, ſo lyes upon the edges of the other, that it reſembles the mouth of an oyl pot, or a pitcher, whereupon the Greeks call it *Arytenoides*. Theſe griſtles thus fitted amongſt themſelves utter a diſtinct voice, by the benefit of the *Epiglottis*, or After-tongue; and alſo of the muſcles opening and ſhutting, dilating and compreſſing them, whence proceed infinite varieties of voices. For thus when they are opened and dilated, they yeeld a heavy, or dull ſound; when they are ſhut or drawn together, a quick, or ſharp ſound; and to conclude, they make it infinite wayes different according to the infinite variety of the dilatation, or conſtriction thereof. Therefore becauſe it was fit theſe griſtles ſhould be moveable, eſpecially the *Arytenoides*, and *Thyroides*, nature hath put to them on each ſide 9 muſcles, of which three are common, and ſix proper. The firſt of the common lying hid under the third muſcle of them that move the bone *Hyoides*, ariſes from the root of the ſame bone, and by an oblique deſcent inſerts it ſelf at the baſis of the ſhield-like griſtle, to dilate it upwards and downwards. The ſecond aſcends obliquely from the inner part of the *ſternon* according to the length of the weazon (whence it is called *Bronchius*) to the bottom and ſides of the ſame ſhield-like griſtle, that it may open and dilate it with its wings. This muſcle is ſeen from the firſt original thereof, even a great part of the way ſtraitlty to cohere with the third muſcle of the bone *Hyoides*; therefore under each of the muſcles, there is a glandulous body ſpred about the fore and upper part of the weazon, on that place where it applies it ſelf to the throttle; this body although it reſemble a fleſhy ſubſtance, yet it is a glandule, which being pluckt away by a certain Emperick taking upon him to cure the kings evill, cauſed a defect of voice on one ſide, becauſe he pulled away the recurrent nerve lying upon the glandule as it goes to the throttle, as *Galen* reports, *Lib. de locis affectis*. The third and laſt ariſes from the parts of the *Vertebra's* of the neck lying tranſverſly upon the ſides of the gullet, and ends at the wings and ſides of the ſhield-like griſtle, that it may tye it more ſtraitly to the ſecond griſtle. But theſe three are called common muſcles, becauſe they take their originall from ſome other place than the throttle, that ſo they may be inſerted into ſome part thereof; for they are called the proper muſcles which ariſe from the Throttle it ſelf, which we have ſaid to be ſix on each ſide: the firſt of which ariſing from the fore part of the ſecond griſtle, makes a circle under the baſis of the ſhieldlike griſtle; whilſt aſcending obliquely to the baſis thereof, it is afterwards inſerted in a part of it, ſo to ſtrengthen and dilate it. The ſecond in like manner ariſing from the ſecond griſtle, from that place where it adheres to the firſt, it runs obliquely croſſing the firſt to the inner and forepart of the griſtle *Thyroides* neer to the baſis thereof, that it may joyn it to the ſecond. The third from the hind baſis of the ſecond griſtle aſcends directly to the baſis of the third griſtle *Arytenoides*, that with the ſecond muſcle it may open and ſhut it. The fourth aſcends from the ſides of the ſecond griſtle, neer the originall of the ſecond muſcle, to the ſides of the *Arytenoides*, that with the ſecond muſcle it may open and ſhut it. The fift ariſes from the inner middle of the ſhield-griſtle, and ends in the fore-part of the *Arytenoides* at the inſertion of the fourth muſcle, that ſo it may preſs down the ſaid griſtle.

The magnitude, figure, and compoſure.

The deſcription of the 3 griſtles of the *Larinx.*

Whence the infinite variety of voices proceed.

The muſcles of the *Larinx.* Their number.

A notable hiſtory.

Whence the muſcles of the Throttle have their nerves,

The ſixt and laſt aſcends by the hind baſis of the *Arytenoides* to the fore baſis of the ſame, to preſs it down. But you muſt note, that all ſuch muſcles as ariſe from below upwards, receive branches from the recurrent, but eſpecially thoſe who open and ſhut the griſtle *Arytenoides*. But the ſite, temper, connexion, and uſe of the throttle may eaſily be known by that we have ſaid before: Although it be a thing very full of difficulty to ſearch out and demonſtrate all the conditions of the organicall parts, by reaſon of the diverſity of their compoſition. Wherefore hence-forward concerning the ſubſtance, temper, and other circumſtances of ſuch parts as we ſhall omit, you may have recourſe to thoſe things which we have written in the Demonſtration of the ſimple and ſimilar parts, of which theſe organicall

nicall are composed; as if any should ask of what temper the *Larinx* is, you shall answer, of a cold, dry, and hot, and moist, because it consists both of a gristly and fleshly substance. He which reckons up all the parts of the mouth, must not omit that gristly and membranous body which arises from the roots of the tongue, which that it might be more quick for motion, that is, whereby it might be more easily erected and depressed (for those things which are more soft do continually slide away, but those which are too hard cannot be bended) it was convenient it should be neither too hard nor too soft, that it might be erected whilest we breath, but depressed when we swallow. It is a principall instrument of the voice, for it cannot be well articulated unless the way were strait. Therefore it straitens that way, and the passage of the gristles of the throttle, but specially the *Arytenoides*; it is alwayes moist by a certain native, and inbred humidity; wherefore if it happen to be dried by a feaver, or any other like accident, the speech is taken away. It is bound on both sides by the common membrane of the mouth to the sides of the *Arytenoides* even to the back part thereof, that so like a cover it may open and shut the orifice of the throttle, that none of the meat and drink in swallowing may fall into the weazon, in such abundance as may hinder the egress and regress of the air. For we most not think that this body doth so closely shut the orifice of the throttle, but that some small quantity of moisture alwaies runs down by the inner sides, as the walls thereof, to moisten the lungs; otherwise *Eclegma's* should be of no use in the diseases of the Chest. And because that this little body is partaker of voluntary motion, therefore according to the opinion of some there are four muscles bestowed upon it, two which may open it and two that shut it, on each side one. The opening muscles descend from the root of the bone *Hyoides*, and in their insertion growing into one they are terminated in the root of this body, that is, the *Epiglottis* in the back part thereof. The shutting muscles (in those creatures where they are found) arise on the inside between the coat and gristle thereof. Truly I could never observe and find these four muscles in a man, though I have diligently and earnestly soughe for them, but I have alwayes observed them in beasts. Therefore some have boldly affirmed that this little body in swallowing lies not upon the orifice of the Throttle, unless when it is pressed down by the heavines of such things as are to be swallowed; but that at all other times by reason of the continuall breathing it stands upright, the Throttle being open. There remain as yet to be considered, two small bosomes, or cavities, or rather fissures, which nature hath hollowed in the very throttle under the *Epiglottis*, on each side one, that if by chance any of the meat or drink should fall, or slip aside in the *Larinx*, it might be there stayed and retained. Beside that, the Air too violently entring, should be in some sort broken by these clifts, or chinks, no otherwise then the blood and spirit entring into the heart through the *Auricule* or Ears thereof.

The *Epiglottis*, or After-tongue.

Of potable things some-what alwayes falls upon the Lungs.

The muscles of the *Epiglottis*.

The use of the cavities or fissures of the Throttle.

CHAP. XVI.

Of the Neck and the parts thereof.

FIrst we will define what the Neck is, then prosecute the parts thereof as well proper, as common, especially those of which we have not as yet treated. For it were superfluous to speak any more of the skin, the fleshy pannicle, the veins, arteries, nerves, gullet, weazon and muscles ascending and descending to the parts into which they are inserted alongst the neck; wherefore you must not expect that we should say any thing of the neck, more than to describe the *Vertebra* or rack bones, being the proper parts thereof, and the ligaments as well those proper to the neck, as those which it hath in common with the head; and lastly the muscles as well those it hath in common with the head and chest, as those of its own. Therefore the neck is nothing else, then a part of the head, which is contained between the nowl bone and the first *vertebra* of the back. First in the neck the *Vertebra's* must be considered, and we must shew what they have proper and peculiar, and what common amongst themselves, that we may the more easily shew the originall and insertion of the muscles growing out of them and ending in them. The neck consists of seven *Vertebræ* or Rack-bones, in which you must consider their proper body; and then the holes by which the spinall marrow passes; thirdly the *Apophyses* or processes of the *Vertebræ*, fourthly the holes through which the nerves are disseminated into other parts from the spinall marrow, and besides the perforations of the transverse productions by which the veins, and arteries, which we call *Cervicales*, ascend alongst the neck, and lastly the connexion of these same *vertebræ* or Rack-bones. For the first, by the body of the *vertebra*, we understand the forepart thereof upon which the gullet lies. For the hole, that is not alwayes the largest in those *vertebræ* which are nighest the head: but it is alwayes encompassed with the body of the *vertebræ*, and besides with three sorts of processes, except in the first Rack-bone, that is right, transverse and oblique. By right we understand these extuberancies in the rack-bones of the neck which are hollowed directly in the upper part of them, and rise up crested on each side to sustain and receive the basis of the Rack-bone which is set upon it. By the oblique processes we understand the bunchings out

What the neck is.

What to be considered in the *vertebræ* of the neck.

Which be the right proceſs of the *vertebræ* Which the oblique.

Which the transverſe.

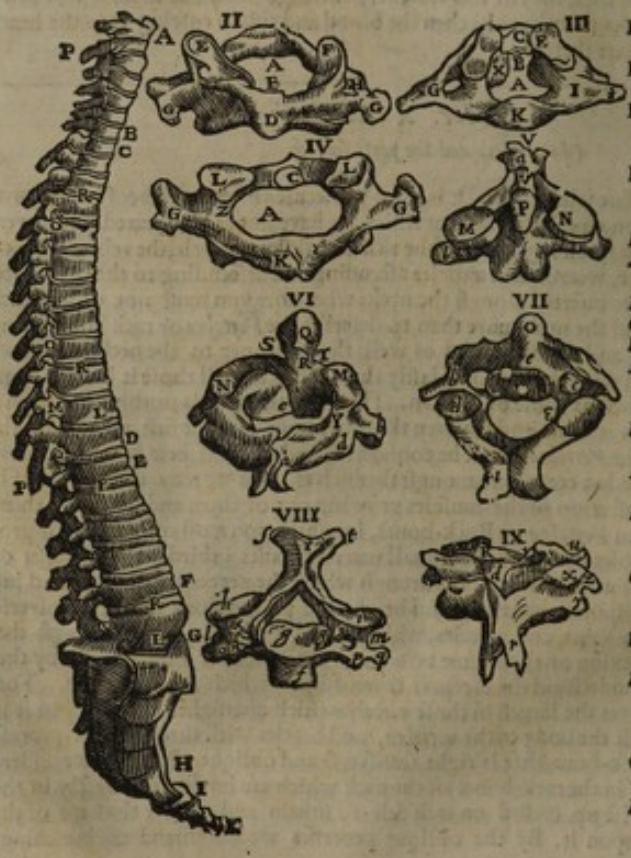
out by which theſe Rack-bones are mutually knit together by *Ginglymos*; theſe are ſeated between the right and tranſverſe proceſſes. By the tranſverſe we underſtand the protuberations next the body, which divide the *vertebra* or Rack-bone in a ſtraight line. Theſe proceſſes are perforated that they may give way to the before deſcribed veins and arteries, which entring the Spinall marrow by the holes of the nerves nouriſh the Rack-bones and parts belonging to them. Beſides you muſt note that the perforations of the Rack-bones of the neck, by which the nerves proceed from the ſpinall marrow to the outward parts, are under the tranſverſe proceſs, that is growing or made by the upper and lower *vertebra*, contrary to all the other which are in the reſt of the Rack-bones. For the connexion of the Rack-bones, you muſt know that all the *vertebræ* of the ſpine have ſix connexions, two in their own bodies, & four in their oblique proceſſes. By the two firſt connexions they are ſo mutually articulated in their own bodies that each are joyned with other both above and below. But by the four other by their oblique aſcendent & deſcendent proceſſes on each ſide two, they are ſo mutually inarticulate, that as the fourth Rack-bone of the neck by its oblique aſcendent proceſſes, is received of the deſcendent proceſſes of the third rack-bone; ſo it receives the oblique aſcendent proceſſes of the firſt, by its oblique deſcendents, for alwayes the oblique aſcendents are received, and the deſcendents receive. Yet we muſt except the firſt Rack-bone of the neck which is contained with four connexions by his lower oblique proceſſes, and by its upper by which it receives the oblique proceſſes both of the nowl-bone, and of the ſecond Rack-bone. The ſecond *vertebra* or Rack-bone muſt alſo be excepted which is holden by five connexions, that is to ſay, four by its oblique proceſſes, and the fift by its own body, by which it is knit to the body of the third *vertebra*. But we muſt note, that whereas nature hath not given a Spine to the firſt Rack-bone, yet it hath given it a certain bunch or extuberancy in ſtead thereof; in like manner, ſeeing it makes no common paſſage with the ſecond *Vertebra* for the paſſing forth of the nerve, it is perforated at the ſides of its body, and it is made very thin on the foreſide, as if it were without body, that it might receive the fore proceſs raiſed in the upper body of the ſecond Rack-bone, which *Hippocrates* calls the tooth, to which the principall Ligament of the head is faſtened, which deſcends within from the hind part of the head under the *Apophyſes clinoides* or proceſſes of the wedg-bone.

The connexions of the *vertebræ* of the neck.

The proceſs called the tooth.

Table 20. *Figure* 1. *Sheweth all the Rack-bones of the back knit together.*
Figure 2. *Sheweth the fore and upper face of the neck, &c. See D.* Crook, *pag.* 398.

FIG. I



From *A*, to *B*, the ſeven *vertebræ* of the neck.
From *C*, to *D*, the twelve *vertebræ* of the cheſt.
From *E*, to *F*, the five rack-bones of the Loines.
From *G*, to *H*, the *Os ſacrum*, or Holy-bone conſiſting, commonly of 6. *vertebræ*.
From *I*, to *K*, the bone *Coccyx* or the rump-bone according to the late writers.
LL, the bodies of the *vertebræ*.
M, the tranſverſe proceſſes of the *vertebræ*.
N, the deſcendent proceſſes.
OO, the aſcendent proceſſes.
PP, the backward proceſſes.
QQ, the holes that are in the ſides of the *vertebræ* through which the nerves are tranſmitted.
RR, A griſtly Ligament betwixt the *vertebræ*.
A, 2, 3, 4, the hole whereout the marrow of the back iſſueth.
B, 2, 3, The cavity which admitteth the root of the ſecond rack-bone.
C, 3, 4, a cavity or *Sinus* in the ſame place cruſted over with a griſtle.
D, 2, a prominence in the outward region of this *Sinus*.
EF, 2, 3, the *Sinus* or cavity of the firſt rack-bone which admitteth the 2. heads of the nowl-bone.
GG, 2, 3, 4, the tranſverſe proceſs of the 1. *Vertebra*.
H, 1, the hole of this tranſverſe proceſs.

-If

I, 3, the *Sinus* which together with the cavity of the nowl-bone marked with *E*, maketh a common passage prepared for the nerves.
K, 3, 4, a rough place where the spine of the first rack is wanting.
LL, 4, two cavities of the first rack receiving the 2. bunches of the second rack marked with *MN*.
MN, 5, 6, the 2. bunches of the second rack which fall into the cavities of the first. *O*, 7, the appendix or tooth of the second rack. *P*, 5, a knub of this appendix crusted over with a gristle. *Q*, 6, the backside of the tooth. *R*, 6, the *Sinus* or cavity of the same, about which a transverse Ligament is rowled containing the said tooth in the cavity of the first rack. *ST*, 6, Certain cavities at the sides of the tooth whence the roots issue of the forebranch of the second pair of sinews. *V*, 5, the point of the the tooth. *X*, 3, an asperity or roughness where is a hole but not thrilled through. *Y*, 6, a cavity of the second rack which together with the cavity marked with *Z*, maketh a hole through which the nerves do issue. *Z*, 4, the *Sinus* of the first rack. *a*, 5, 6, 7, the double spine of the second rack. *b*, 5, 6, 7, the transverse process of the second rack. *c*, 7, the hole of the said transverse process. *d*, 6, 7, the descending process of the second rack whose cavity is marked with *d*, in the 6. figure. *e*, 6, 7, the place where the body of the second rack descendeth downward. *f*, *gg*, 8, the lower side of the body of the third rack at *f*, the two eminent parts of the same at *gg*. *h i*, 8, the ascending processes. *lm*, 8, the two descending processes. *n o p q*, 8, the transverse processes. *r*, 8, 9, the spine or backward process. *ft*, 8, the two tops of the spine. *u*, 9, the descending process of the third rack. *x*, 9, the ascending process. *y*, the transverse process of the third rack. *α*, 8, 9, the hole of this transverse process. *β*, 9, the upper hollowed part of the body of the third rack. *δ*, 9, the *Sinus* or cavity which maketh the lower part of a hole through which the conjugations of the nerves are led. *ε*, 7, the upper part of the same hole.

And by this articulation the head is bended forwards and backwards, as it is moved to the sides by the articulation of the first Rack-bone with the second. That process is bound by two Ligaments, the first of which being greater and broader is externall, comprehending in the compass thereof all the upper articulation, ascending from the rack-bones to the head, or rather descending from the head to them, as any other Ligament going from one bone to another; The other is the stronger and also incompasses the articulation mixing its self with the gristle, which by its interposition binds together all the Rack-bones, the first excepted, as you may see in pulling asunder the Rack-bones of a Swine; and the whole Spine or Back-bone is tyed together and composed throughout with such Ligaments.

By what articulation the head is bended backwards and forwards.

The Holy bone is composed of 4. *Vertebræ* (or rather of five, or six, as in the figure following) besides the Rump-bone, it receives, and holds fast the *Ossa Ilium*, or Hanch-bones, and is as a Basis to all the Rack-bones placed above it, whereby it comes to pass that the Rack-bones from the Head to the Holy-bone grow still thicker, because that which supports ought to bigger than that which is supported. There is a certain moisture, tough and fatty, put between the Rack-bones, as also in other joynts, to make them glib and slippery, that so they may the better move. Whilst this motion is made, the Rack-bones part one from another.

The *Vertebræ* of the Holy bone.

The commodities or uses of the Spine are said to be four. The first is, that it is, as it were, the seat and foundation of the composure and construction of the whole body, as the Carkass is in a ship. The second, that it is a way or passage for the marrow. The third is, because it contains and preserves the same. The fourth is, that it serves for a wall or bulwark to the entrails, which lye and rest upon it on the inside. And because we have fallen into mention of Ligaments, it will not be amiss to insert in this place, that which ought to be known of them. First, therefore, we will declare what a Ligament is, then explain the divers acceptions thereof, and lastly prosecute their differences.

The manifold uses of the Backbone.

Therefore a Ligament is nothing else than a simple part of mans body, next to a bone and Gristle the most terrestriall, and which most usually arises from the one or other of them either mediately or immediately, and in the like manner ends in one of them, or in a Muscle, or in some other part; whereby it comes to pass that a Ligament is without blood, dry, hard, cold, and without sense, like the parts from whence it arises, although it resemble a Nerve in whiteness and consistence, but that it is somewhat harder.

What a Ligament is.

Why it is without sense.

A Ligament is taken either generally or more particularly; in generall, for every part of the body, which tyes one part to another, in which sense the skin may be called a Ligament, because it contains all the inner parts in one union. So the *Peritoneson* comprehending all the naturall parts, and binding them to the back-bone: so the membrane investing the Ribs, (that is, the *Pleura*) containing all the vitall parts; thus the membranes of the brain, the nerves, veins, arteries, muscles, membranes, and lastly all such parts of the body, which bind together and contain other, may be called Ligaments, because they bind one part to another; as the nerves annex the whole body to the brain, the Arteries fasten it to the heart, and the veins to the liver. But to conclude, the name of a Ligament more particularly taken, signifies the part of the body, which we have described a little before.

What parts may be called Ligaments in a generall signification.

The differences of Ligaments are many, for some are membranous and thin; others broad, othersome thick and round, some hard, some soft, some great, some little, some wholly gristly, others of a middle consistence beeween a bone and a gristle, according to the nature of the motion of the parts, which they bind together in quickness, vehemency and slowness. We will shew the other differences of Ligaments, as they shall present themselves in dissection.

The differences of Ligaments properly so called.

CHAP.

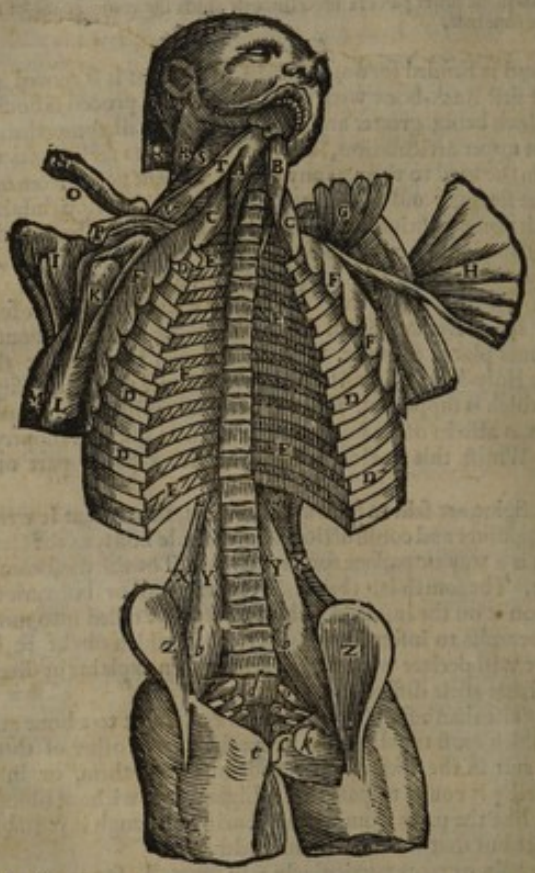
CHAP. XVII.

Of the Muſcles of the Neck.

Their number.

THe Muſcles of the neck as well proper as common, are in number twenty, or elſe twenty two, that is, ten, or eleven on each ſide; of which, ſeven only move the head, or the firſt *vertebra* with the head; the other three or four, the neck it ſelf. Of the ſeven which move the head, and with the head the firſt *Vertebra*, ſome extend and erect it, others bend and decline it, others move it obliquely, but all of them together in a ſucceſſive motion move it circularly, and the like judgment may be of the Muſcles of the Neck.

The fourth Figure of the Muſcles. This Figure ſheweth the cavities of the middle and lower bellies, the bowels being taken out, but moſt part of the bones and muſcles remaining.



AB. The firſt muſcle bending the neck called *Longus*.
CC. The ſecond bender of the neck called *Scalenus*.
DDDD. The outward *intercoſtall* muſcles.
EEEE, The inner *intercoſtall* muſcles.
FFF, The ſecond muſcle of the cheſt called *ſerratus maior*.
G, The firſt muſcle of the ſhoulder-blade called *ſerratus minor*, ſeparated from his originall.
H, The firſt muſcle of the arm called *Pectoralis*, ſeparated from his originall.
I. The ſecond muſcle of the arm called *Deltoides*.
K. The bone of the arm without fleſh.
L, The firſt muſcle of the cubit callad *Biceps*.
M. The ſecond muſcle of the cubit called *Brachiæus*.
N. The clavicle or coller-bone bent backward.
O. The firſt muſcle of the cheſt called *ſubclavius*.
P, The upper proceſs of the ſhoulder-blade. *Q.* The firſt muſcle of the head called *obliquus inferior*. *R.* The ſecond muſcle of the head called *Complexus*. *S.* The fourth muſcle of the ſhoulder blade called *Levator*. *TV.* The two bellies of the fourth muſcle of the bone *Hyoïs*. *XX. aa.* The fift muſcle of the back whoſe originall is at *aa*. *YY. bb. cc.* The ſixt muſcle of the thigh called *Pſoæ*, whoſe originall is at *c c.* and tendon at *b b.* *ZZ.* The ſeventh muſcle of the thigh. *d.* the holy bone. *ooo.* The holes of the holy bone, out of which the nerves do iſſue. *e.* A portion of the fifth muſcle of the thigh ariſing from the ſhare-bone. *f* the ſhare-bone bared. *k.* The ninth muſcle of the thigh or the firſt *circumactor*.

But before I can come to the deſcription of their originall and inſertion, I muſt admoniſh thee, that the 2 Muſcles of the ſhouder-blade muſt firſt be taken away by diſſection; that is, the *Trapezius*, or Table-muſcle, and the *Rhomboides*, or ſquare-muſcle; whoſe originall and inſertion that we may the better demonſtrate, (or rather the action by which we ſeek that originall and inſertion,) they muſt be pulled up, beginning at their inſertion, which is at the ſhoulder-blade (as ſhall be ſhewed in the proper place) turning them up towards their originall, that is, to the Spine. Beſides the leſs *Rhomboides*, the hinder, and upper (called alſo the *Dentatus* or toothed-muſcle) muſt be raiſed from its originall, which is at the three lower Rack-bones of the Neck and the firſt of the back, and turned up to its inſertion, which is at three ſpaces of the lower ribs nigh

nigh to the hind, and upper angle of the Shoulder-blade, as ſhall be ſhewed in fit place hereafter. Theſe muſcles thus raiſed up, the 4 muſcles which ereſt and extend the head muſt be taken away, and then thoſe two which move it obliquely, and laſtly one which bends, or declines, for thus anatomicall order requires. Yet if you think good, you may, not hurting the other, firſt of all cut away that which is called the *Maſtoides*, which declines or bends the head. For theſe 4, which lift up and extend the head, the firſt from the figure of the ſpleen is called the *Splenius*, it aſcends from the 5, upper ſpines of the back and the 4, lower of the neck, and is obliquely inſerted at the back part of the head and the mamillary proceſs, whence you may raiſe it towards its originall. The ſecond by reaſon of its compoſure is called *Complexus*; this paſſing from the third, fourth and fifth tranſverſe proceſs of the back and often from the firſt of the neck, aſcends directly to the back part of the head, incompaſſing the lower and ſide part of the neck, you may eaſily take it up; if you begin at the ſpine, and ſo go forwards to the tranſverſe proceſſes and mamillary proceſſes of the nowl-bone. This *Complexus* may be divided into two or three muſcles, but that with ſome difficulty, by

The *Splenius*.

The *Complexus*.

The fifth Figure of the muſcles in which ſome muſcles of the Head, Cheſt, Arm, and ſhoulder-blade are deſcribed.

I. The proceſs of the ſhoulder-blade, called the top of the ſhoulder.

O. The fourth muſcle of the arm or *the greater round muſcle*, to which *Fallopius* his right muſcle is adjoined, which ſome call the *leſſer round muſcle*.

Q Q. The ſixt muſcle of the arm or the upper *bade-rider*.

X. The ſecond muſcle of the ſhoulder-blade or the *Levator* or heaver.

Z. The ſecond muſcle of the cheſt or the *greater Saw-muſcle*.

Y. The fift muſcle of the cheſt or muſcle called *Sacrolumbus*.

α β. His place wherein he cleaveth faſt to the longeſt muſcle of the back.

γ γ. The tendons of the muſcle obliquely inſerted into the ribs.

δ δ. The firſt pair of the muſcles of the head or the Splinters.

Ch. 8. 9. Their length whoſe beginning at 8 and inſertion at 9.

10. 11. The ſides of this muſcle.

12. That diſtance where they depart one from the other.

13. The two muſcles called *Complexi*, near their inſertion.

ε. The ſecond muſcle of the back or the *Longeſt* muſcle.

ζ. The fourth muſcle of the back or the *Semi-ſpinatus*.

θ. The ſhoulder-blade bare.

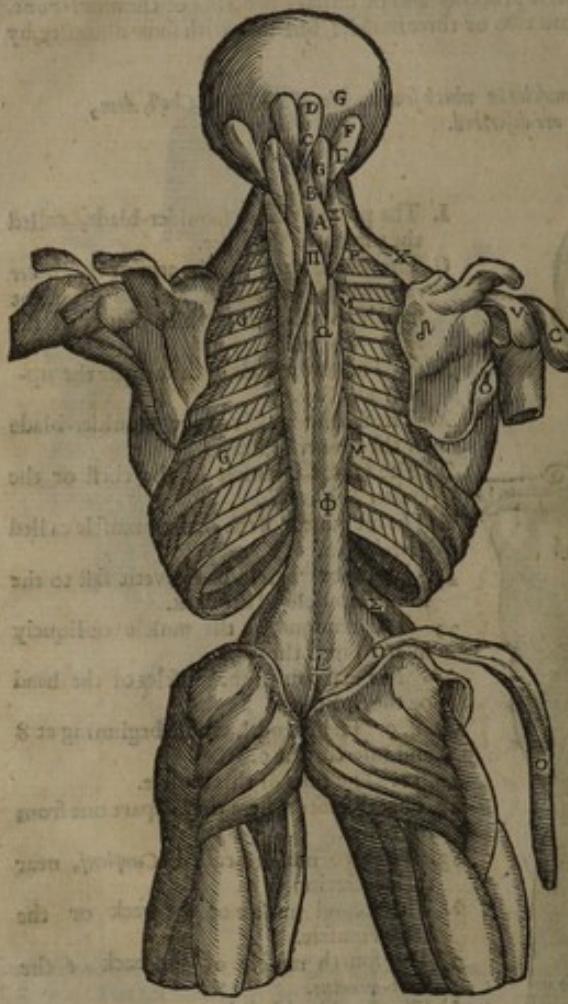
ρ. A part of the tranſverſe muſcle of the *Abdomen*.

reaſon of its folded texture. The third and fourth, which be two of the eight little muſcles, being four on each ſide, do aſcend ſomewhat obliquely, the firſt truly from the whole ſide of the ſecond *Vertebra*. The ſecond from the whole ſide of the proceſs of the firſt *Vertebra*, which it hath in ſtead of a ſpine; they aſcend to the back part of the head juſt againſt the ſpine; theſe two muſcles by the conſent of all Anatomiſts are called right, or direct muſcles, only moving the head: theſe truly muſt not be pluckt from the places of their originall, nor inſertion, but only bound by a ſtring put under them, that ſo they may be the more eaſily ſhewed. On each ſide follow two oblique muſcles, one whereof only moves the head; the other primarily the firſt *Vertebra*, but ſecondarily, and by

The *Recti*, or right muſcles.

accident the head it ſelf. For the firſt, contrary to the opinion of ſome, it ariſes from the tranſverſe proceſs of the firſt rack-bone, and then is inſerted, above the inſertion of the firſt right muſcle: the which in like manner you muſt lift up, by ſomething put underneath it, but not ſeparate it. The other entring forth of the ſpine of the ſecond *Vertebra*, is inſerted at the proceſs of the firſt, contrary to the originall of the precedent, although ſome think otherwiſe. It will be convenient in the like manner only, to lift up this with a ſtring, and not pluck him from his place, that ſo you may ſee how all theſe make a perfect triangle. The action of this muſcle is contrary to the action of the precedent, as the contrariety of its originall and inſertion ſhew.

The ſixth Figure of the muſcles, ſhewing ſome of the muſcles of the Head, Back, Cheſt, Shoulder-blade and Arm.



A D. the ſecond pair of the muſcles of the head, or the two *Complexi*, the firſt part is at *A D.*
B C. the ſecond part *E F*, the third part riſing up under *G* and inſerted at *F.*
G. the fourth part of this muſcle or the right muſcle of the head according to *Fallopius*, which *Veſalius* made the 4 part of the 2.
G G. (Betwixt the ribs) the externall *Intercoſtall* muſcles.
L. the originall of the 2. muſcle of the back.
M. His tendons at the rack-bone of the neck.
The upper *O* the fourth muſcle of the arm or the *greater round* muſcle.
O O. the lower, the 6 muſcle of the cheſt, or the *Sacrolumbus* hanging from his originall.
Q. the ſixt muſcle of the arm or the upper *Bladerider* inverted.
V. the third ligament of the joynt of the arm.
X. the fourth muſcle of the ſhoulder-blade or the *beaver.*
Z. the ſecond muſcle of the Cheſt, or the greater *Saw muſcle.*
Ж. the three muſcles of the neck called *Tranſverſalis.*
Π. the 4 muſcle of the neck called *Spinatus.*
Σ. the firſt muſcle of the back, or the *Square muſcle.*
Φ. the 2. muſcle of the back or the *Longeſt*, whoſe originall is at *L* and his tendons at the *Vertebra* at *M M.*
Ω. the fourth muſcle of the back called *Spinatus.*
δ. the back of the ſhoulder-blade flayed.

Which may be truly called the proper muſcle of the neck.

Wherefore when the firſt oblique moves the head obliquely forwards, the ſecond puls it back by the firſt *Vertebra*, this with his aſſociate of the other ſide, may be truly termed the proper muſcles of the neck, becauſe they belong to no other part; whereas it is contrary in other muſcles. But we muſt note, that the head (according to *Galens* opinion) hath two motions, one directly forwards and backwards, as appears in beckning it forwards, and caſting it backwards; the other circular.

The two motions of the head.

The firſt in *Galens* opinion is performed by the firſt *Vertebra* moved upon the ſecond; the ſecond by the head moved upon the firſt *Vertebra*; for which he is reproved by the latter Anatomiſts, who teach that the head cannot be turned round or circularly upon the firſt *Vertebra* without putting it out of joynt.

The *Maſtoideus.*

For the laſt which bends the head, it aſcends from the upper and ſide part of the *Sternon*, and the next part of the clavicle, obliquely to the *Apophyſis Maſtoides* or mamillary proceſs of the hind part of the head, whence it is called the *Maſtoideus.* You may divide this by reaſon of its manifold originall rather into two, than into three muſcles. But it had been better that the head might have been moved every way, equally back-

backwards and to the right and left sides; but thus it would often have been strained to our great damage and danger of life; neither could there have been such facility of motion without a loosness of the joint. Therefore nature had rather bestow upon the head an harmless faculty of fewer motions, than one furnished with more variety, but with a great deal more uncertainty and danger. Wherefore it hath made this juncture not laxe or loose, but stiffe and strong.

The seventh Figure of the muscles; shewing some muscles of the head and Chest, the Trapezius *or Table-muscle being taken away: as also of the blade and arm.*

A. The prominent part of the fourth muscle of the chest called *Serratus posticus superior.*
Δ. the first muscle of the head called *splenius.*
E E. the insertion of the second muscle of the head called *complexus.*
I. the coller bone bared.
M. the back part of the second muscle of the arm called *Deltois.*
ζ *H.* his backward originall.
ſ. his implantation into the arm.
N N. the fourth muscle of the arm called *Latissimus.*
Sμ. his originall from the spines of the rack-bones and from the holy-bone.
σ. the connexion of this muscle with the hanch-bone, which is led in the inside frm μ to σ.
ω. the place where it lyeth upon the lower angle of the Basis of the shoulder-blade.
O. the four muscles of the arm called *Rotundus major.*
e. some muscles of the back do here offer themselves.
P. the fift muscle of the arm called *superscapularis Inferior.* *Q.* the sixt muscle of the arm called *Superscapularis Superior.* *S.* the beginning of the third muscle of the arm called *Latissimus.* *V.* the third muscle of the blade called *Rhomboides.* ♀ *X.* his originall from the spines of the rackbones. ♄ ω. his insertion into the basis of the shoulder-blade. χ. the fourth muscle of the blade called *Levator.* * a part of the oblique descendent muscle of the *Abdomen.*

After the shewing of these muscles, we must come to three or four of the neck, of which number two (which some reduce to one) extend, another bends, and the last moves side wayes, and all of them with a motion succeeding each other turn it about as we said of the muscles of the head. The first of these which extend, taking its originall from the six transverse processes of the six upper rack-bones of the back, or rather from the root of the oblique, ascends directly to the spine of the second *vertebra* of the neck, and the oblique proces thereof; some call it the *Transversarius*; that is, the transverse-muscle. This, if you desire to take it away, it is best first to separate it from the spine, then to turn it upwards to the transverse processes; unless you had rather draw it a little from its partner and companion in that place where their originals are distinct, seeing it is the last and next to the bones. *The Transversarius.*

Marvell not, if you find not this distinction of their originall, so plain and manifest, for it is commonly obscure. For the muscle *spinatus*, as it most commonly comes to pass, arising from the roots of the seven upper spines of the back, and the last of the neck, is inserted into other spines of the neck, so that it might easily be confounded with the former *The Spinatus*

by *Galen*. The third bends the neck, and ariſing within from the body of the five upper *Vertebræ* of the back (though with a very obſcure originall, ſpecially in lean bodies) it aſcends under the gullet alongſt the neck, even to the nowl-bone, into whoſe inner part it is obſcurely inſerted. Wherefore it is likely that it helps not only to bend the neck, but alſo the head. This muſcle is made of oblique fibers proceeding from the body of the *Vertebræ*, all the way it paſſes to the tranſverſe proceſſes of the other *Vertebra*. But it ſeems with its copartner which is oppoſite to it, to make a certain hollow path upon the bodies of the *Vertebræ*, to the gullet, and it is called the long muſcle. The fourth and laſt, which we ſaid moves the neck to one ſide, is called *Scalenus* from the figure thereof; it aſcends from the hinder and upper part of the firſt rib of the Cheſt, inſerting its ſelf into all the tranſverſe proceſſes of the neck by its fibers, which as it were for the ſame purpoſe, it hath ſufficiently long, that it may faſten it ſelf from the furtheſt and loweſt proceſs of the neck into the firſt or higheſt thereof. The paſſage of the nerves through this to the arm makes this muſcle ſeem double or divided into two. For the veins and arteries pertaining to the neck, they have been declared in the proper Chapters of the diſtributions of the veſſels; it remains that you note, all theſe muſcles receive nerves from the *Vertebræ* whence they ariſe.

The *Longus*.
The *Scalenus*.

The eight Figure of the muſcles, eſpecially thoſe of the Cheſt, Head, and Shoulder blade, the Trapezius, Latiſſimus, *and* Rhomboides, *being taken away.*

A. The fourth muſcle of the cheſt, or the upper and hinder Saw-muſcle.

B. the 5 muſcles of the cheſt, or the lower and hinder Saw-muſcle.

a. b. a membranous beginning of the muſcle of the *Abdomen*, deſcending obliquely down from the ſpine of the back.

C. the firſt muſcle extending the Cubit at *c*, his originall is from the neck of the arm, and from the lower baſis of the blade at *d*.

E. the originall of the fourth muſcle of the bone *hyois* from the blade.

G G. the outward intercoſtall muſcles.

I. the Clavicle or coller-bone bared.

N. the upper, the ſecond muſcle of the arm called *Deltois*, char. 4,5. the beginning of this muſcle.

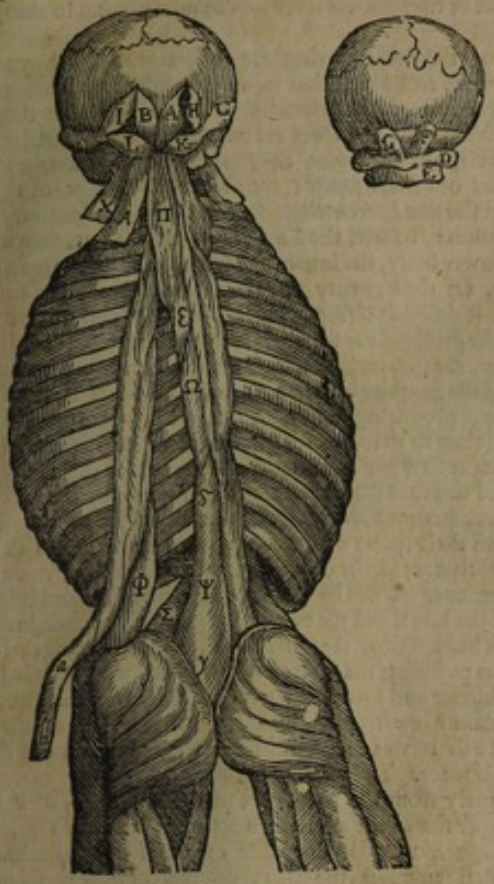
N. the third muſcle of the arm or the broad muſcle ſeparated.

O. the fourth muſcle of che arm or the lower *Super-Scapularis* or blade-rider.

1, 2, 3. Char. His originall at the baſis of the ſhoulder-blade at 12. and his inſertion into the joynt of the arm at 3. Q. the ſixt muſcle of the arm or the upper *Super-Scapularis*. *X.* the fourth muſcle of the blade called *Levator* or the heaver. *Z.* the ſecond muſcle of the Cheſt or the greater Saw-muſcle. 7.7. Char. the ribs. Γ. the ſixt muſcle of the cheſt, or the muſcle called *Sacrolumbus*. Δ. the firſt muſcle of the head or the ſplinter. E E. the ſecond muſcle of the head or the inſertion of the muſcles called *complexi*. Φ. the ſecond muſcle of the back or the longeſt muſcle. Ω. the fourth muſcle of the back called *Semiſpinatus*.

The

The ninth Figure of the muſcles, ſhewing the muſcles of the Head and Neck.



A B. the third pair of the Muſcles of the head called *Recti Majores.*
C. the Mamillary proceſs.
D. the tranſverſe proceſs of the firſt rackbone.
E, the proceſs of the ſecond rackbone of the neck.
F G, the fourth pair of muſcles of the head called *Recti Minores.*
H I, the fift pair of muſcles of the head called *obliqui Supeeirior.*
K L, the ſixt pair of muſcles of the head called *obliqui inferiores.*
X, the fourth pair of muſcles of the ſhoulder blade.
Λ, the ſecond muſcle of the neck called *Scalenus*, which *Falopius* maketh the eight muſcle of the cheſt.
Π, the fourth muſcle of the neck called *ſpinatus.*
Ξ, the firſt muſcle of the back called *Quadratus.*
Φ, the ſecond muſcle of the back called *Longiſſimus.*
a, the *ſinus* or boſom of this muſcle, whereby it giveth way unto the third muſcle of the back, called *Sacer.*
b, his Originall.
Ψ, the third muſcle of the back called *Sacer.* γ, his Originall. δ, his end.
Ω, the fourth muſcle of the back called *Semiſpinatus.* ε, his upper end under the fourth muſcle of the neck.

CHAP. XVIII.

Of the Muſcles of the Cheſt and Loyns.

In what the *Vertebræ* of the neck and loins agree and diſagree.

WE muſt now ſpeak of the Muſcles both of the Cheſt which ſerve for reſpiration, as alſo of the Loins. But firſt we muſt know that the hind part of the Cheſt called the *Metaphrenum*, or back, conſiſts of twelve *Vertebræ*, the loins of five, all which differ not from the *Vertebræ* of the neck, but that they are thicker in their bodies than theſe of the neck; neither are they leſſer in holes, neither have they their tranſverſe proceſſes perforated or parted in two as the rackbones of the neck have. Beſides each of theſe rack bones alone by it ſelf, on each ſide in the lower part thereof makes a hole, through which a nerve hath paſſage from the ſpinall marrow to the adjacent parts, when on the contrary in the *Vertebræ* of the neck, ſuch holes or paſſages are not made, but by meeting together of two of them.

Concerning the proceſſes of the Rackbones of the Cheſt, whether tranſverſe, right or oblique, they differ nothing from theſe of the neck (I mean even to the tenth) but that the tranſverſe ſeeing they are not perforated, as we ſaid before, do as it were ſuſtain the ribs, being ſtraitly bound to them with ſtrong ligaments both proper and common; but after the tenth *Vertebra* of the back, the two other of the back, and all thoſe of the loins are different, not only from thoſe of the neck, but alſo from the ten firſt of the back, by reaſon of their oblique proceſſes, becauſe from the eleventh (which is received, as well by that which is above it, as by that under it, for the ſtrength of the whole back, and the eaſier bending thereof without fear of fracture or diſlocation) the above mentioned proceſſes of the lower rack bones which were wont to receive, are received; as on the contrary they receive which were wont to be received. They differ beſides from all the forementioned, by reaſon of their ſpines, becauſe from the eleventh they begin by little and little to look upwards, contrary to the former.

But if any ask, how the tenth *vertebra* of the back may be termed the midſt of the

How the tenth *vertebra* of the back, may be ſaid to be the middle of the ſpine.

ſpine, being the whole ſpine conſiſts of twenty four *vertebræ*? He may know that this may be true, as thus; if the ſix bones of the holy bone, and the fourth of the Rump (being more griſtly than bony) be numbred amongſt the bones of the Spine; for then from the ſetting on of the head to the eleventh rack bone of the back are ſeventeen in number, and ſo many from thence downwards.

The number of the muſcles of the Cheſt.

But let us return to the muſcles of the Cheſt ſerving for reſpiration. Firſt, you muſt know that theſe Muſcles are fourſcore and nine, that is, on each ſide forty four, alike in ſtrength, thickneſs, ſite, and action; and one beſides in the midſt which they call the *Diaphragma* or midriffe. Of theſe forty four, there are twenty two which dilate the cheſt in drawing in the breath; that is, the *Subclavius*, the *Dentatus*, or *Serratus major* in the opinion of ſome, both the *Rhomboides* or *Serrati poſtici*; the oblique aſcendent of the lower belly, the eleven *Intercoſtales*, and the ſixe *Intercartilaginei externi*. On the contrary, as many contract the breaſt in expiration; to wit, the *Sacrolumbus*, the oblique deſcendent, the Right and tranverſe of the lower belly, the inner Trangular, the ſix *Intercartilaginei*, and the eleven inner *Intercoſtales*. Of theſe twenty two dilating the Cheſt, the firſt from the ſite is called the *Subclavius*, for it deſcends obliquely from the inner and forepart of the *Clavicula* or Caller bone, into the griſtle of the firſt rib, even to the *Sternon*, and dilates it. The ſecond is the *Serratus major*, the greater Saw muſcle ariſing according to the opinion of ſome from the whole *baſis* of the ſhoulder blade on the inſide, and it is tranſverſly inſerted into the nine upper ribs, producing certain toothed or ſaw-like proceſſes running further to the bones of the rib, than to the ſpaces between them, or Intercoſtall muſcles, whereupon it hath the name of the Saw muſcle; yet ſome have referred this muſcle to them of the ſhoulder blade. The third deſcends from the three lower ſpines of the neck, and the firſt of the back, by means of a membranous and moſt thin ligament, into the three or four upper ribs, running further into their ſpaces or Intercoſtall muſcles, than into the ribs themſelves, whereupon it is called *Serratus poſterior & ſuperior*, that is, the hinder and upper Saw muſcle. The fourth in like manner aſcends by means of a membranous and thin ligament from the three upper ſpines of the loins, and the two laſt of the cheſt, or back, into three or four of the lower, or laſt of the baſtard ribs, ſent forth further into them or their bones, than into the Intercoſtall muſcles poſſeſſing the ſpaces between them, wherefore it is called *Serratus poſterior & inferior*, the hinder and lower Saw muſcle. Moreover theſe two laſt muſcles have been called by a common name from their figure the *Rhomboides*, that is, the ſquare muſcles. The fifth which we ſaid was the aſcendent of the *Epigaſtrium*, hath already been ſufficiently deſcribed in his place. The eleven *Intercoſtales externi*, or externall Intercoſtall muſcles deſcend obliquely from the back part of the lower ſide of the upper rib, into the forepart of the upper ſide of the rib lying next under it, after a quite contrary manner to the ſix *Intercartilaginei*, who having like originall and inſertion amongſt the griſtles, as the Intercoſtall amongſt the ribs, deſcend obliquely from the forepart backwards. And thus much of the muſcles dilating the Cheſt in inſpiration.

The muſcles dilating the Cheſt.

The muſcles contracting the Cheſt.

The *Subclavius* is the firſt of the muſcles dilating the cheſt.

Serratus major.

Serratus poſterior and *ſuperior.*

The oblique aſcendent of the lower belly.

The eleven *Intercoſtales externi.*

6. *Intercartilaginei.*

But the firſt, of the other muſcles, being as many in number, which contract the Cheſt in expiration, ariſing from the holy-bone, and the oblique proceſſes of the loines, aſcends (firmly and confuſedly adhering with the *Muſculus ſacer*, or holy muſcle, which we ſhall deſcribe hereafter) to the roots of the twelve ribs, imparting in the aſcent a ſmall tendon to each of them, by which it draws theſe ribs towards the tranſverſe proceſſes; and by reaſon of its Originall it is called *Sacrolumbus*, that is, the Holy loin-muſcle.

The *Sacrolumbus*, the firſt of thoſe which contract the cheſt.

The ſecond, third, and fourth, which we ſaid were the oblique deſcendent, right, and tranſverſe of the *Epigaſtrium*, have been formerly deſcribed in their place.

The oblique deſcendent, the right and tranſverſe of the *Epigaſtrium.*

But by the way you muſt note that theſe three muſcles of the *Epigaſtrium* help expiration rather by accident, than of themſelves, to wit, by driving back the midriff towards the lungs by the entrails, which alſo they force upwards, by drawing the parts into which they are inſerted towards their Originall. The fifth which we called the *Triangulus*, or Triangular, may be called the *compreſſor* of the griſtles, which proceeding from the inner ſides of the *Sternon*, goes to all the griſtles of the true ribs; this is more apparent under the *Sternon* in beaſts, than in men, though it be not very obſcure in them neither. For the internall Intercoſtall muſcles, in my judgment, they ariſe from the lower ſides of the upper rib, & deſcending obliquely from the forepart backwards, are inſerted into the upper ſide of the rib next under it; ſo that they may follow the production of the fibers of the externall *Intercartilaginei*; as the ſix internall *Intercartilaginei* follow the ſite of the externall Intercoſtall proceeding from behind forwards; wherefore as well the Intercoſtall, as the *Intercartilaginei*, every where interſect each other, after the ſimilitude of the letter X. I know ſome have written that the internall muſcles (whether intercoſtall or *Intercartilaginei*) aſcend from the upper ſide of the lower rib forwards, and backwards.

Triangulus muſculus.

Intercoſtales interni.

Intercartilaginei interni.

But if this were true, it would follow that theſe muſcles admitted their nerves in their tail, and not in their head, ſeeing the nerve alwayes goes under the rib, and not above it.

Muſcles alwayes receive their nerves in their heads.

The

The midriffe. The muſcles of the loins. They are three pair.

The laſt muſcle of the cheſt, that is, the *Diaphragma* or Midriffe, is ſufficiently deſcribed before; wherefore it remains we deſcribe the muſcles of the Loins. Theſe are ſix in number, on each ſide three, equall in thickneſs, ſtrength and ſituation; one of theſe bends, and the other two extend the Loins; it is called by reaſon of the figure the *Triangulus*, or Triangular which bends the Loins, it aſcends from a great part of the hind ſide of the Hanch-bone into the tranſverſe proceſſes of the Loins, and the laſt of the Cheſt on the inſide, for which cauſe it is made of fibers ſhort, long, and indifferent, anſwering to the nearneſs or diſtance of the ſaid proceſſes. The firſt of the extenders is called the *Semiſpinatus*, becauſe even to the middle of its body it takes the originall from the ſpines of the Holy bones and Loins; this with its oblique fibers aſcends from all the ſaid ſpines to the tranſverſe proceſſes, as well of the Loins as Cheſt. The other is called *Sacer*, the Holy-muſcle, becauſe it takes its originall from the Holy-bone, or the ſides thereof; it aſcends with its oblique fibers to the ſpines of the Loins, and of the eleaven lower Rack-bones of the Cheſt.

Triangulus.

Semiſpinatus.

Sacer.

CHAP. XIX.

Of the Muſcles of the Shoulder-blade.

The deſcription of the blade-bone, or ſhoulder-blade.

NOw we muſt deſcribe the muſcles of the extreme parts, and firſt of the Arm; taking our beginning from theſe of the ſhoulder-blade. But firſt, that we may the better underſtand their deſcription, we muſt obſerve the nature and condition of the ſhoulder-blade. Therefore the blade-bone on that part, which lies next unto the ribs, is ſomewhat hollowed; wherefore on the other ſide it ſomewhat buncles out. It hath two ribs, one above, another below: by the upper is meant nothing elſe than a border or right line, which looking towards the temples is extended from the exterior angle thereof under the collar-bone, even to the Proceſſe *Coracoides* which this rib produces in the end thereof: By the lower, the underſide which lies towards the lower belly and the ſhort ribs.

The baſis of the blades. The head of the ſhoulders blade.

Beſides, in this ſhoulder-blade we obſerve the *baſis*, head and ſpine. By the *baſis* we underſtand the broader part of the ſhoulder-blade, which looks towards the back-bone. By the head we underſtand the narrower part thereof, in which it receives the head of the Arm in a cavity, indifferently hollow, which it produces both by it ſelf, as alſo by certain griſtles, which there faſtned encompaſſe that cavity. This kind of cavity is called Glene.

This receives and contains the bone of the arm, by a certain ſtrong ligament encompaſſing aud ſtrengthning the joint, which kind of ligament is common to all other joints; this ligament ariſes from the bottom of the cavity of the ſhoulder-blade, and circularly encompaſſes the whole joint, faſtning it ſelf to the head of the arm; there are alſo other ligaments beſides this, which incompaſſe and ſtrengthen this articulation. By the ſpine is meant a proceſſe, which riſing by little and little upon the gibbous part of the blade, from the *baſis* thereof where it was low and depreſt, becomes higher untill it ends in the *Acromion*, or upper part thereof. Nature hath made two productions in this bone (that is to ſay, the *Acromion* from the ſpine, and the *Coracoides* from the upper ſide) for the ſtrengthning of the articulation of the arm and ſhoulder-blade, that is, leſt the arme ſhould be eaſily ſtrained upward or forwards; beſides, it is faſtned to the clavicle, by the proceſſe *Acromion*.

The ſpine of the blade. The proceſſes *Acromion* and *Coracoides*. The muſcles of the ſhoulder-blade.

The muſcles which move the ſhoulder-blade are ſix in number, of which four are proper, and two common. The firſt of the four proper ſeated in the forepart, aſcends from the bones of five or ſix of the upper ribs, to the *Coracoides*, which it drawes forwards, and is called *Serratus minor*, that is, the leſſer ſaw-muſcle; which that you may plainly ſhew, let it is fit you pull the pectorall muſcle from the collar-bone, almoſt to the middle of the *Sternon*. The other firſt oppoſite againſt it, is placed on the fore ſide, and draws its originall from the three lower ſpines of the neck, and the three upper of the Cheſt, from whence it extends it ſelf, and ends into all the griſtly baſis of the ſhoulder-blade, drawing it backwards; it is called the *Rhomboides*. The third from its action, is called the *Levator*, or the heaver, or lifter up, ſeated in the upper part, it deſcends from the tranſverſe proceſſes of the four firſt *Vertebræ* of the neck into the upper angle and ſpine of the blade. The fourth called *Trapezius*, or the Table-muſcle, is ſeated in the back-part and is membranous at the originall, but preſently becomes fleſhy: it ariſes from almoſt all the back-part of the head, from all the ſpines of the neck, and the eight upper *Vertebræ* of the cheſt, and then is inſerted by his nervous part, almoſt into the whole baſis of the blade, extending it ſelf above the muſcles thereof, even to the midſt of its ſpine, where being fleſhy it is inſerted even to the *Acromion*, the upper part of the clavicle, and in ſome ſort to the upper rib. This muſcle hath a threefold action, by reaſon of its triple originall. The firſt is to draw the ſhoulder-blade towards its originall, that is, to the nowle, and ſpine of the neck; the other is to draw it towards the back, becauſe of the contraction of the middle or tranſ-

Serratus minor.

Rhomboides.
Levator.
Trapezius.

tranſverſe fibers which lead it directly thither;and the other is to draw it downwards by reaſon of the originall it hath from the fifth, ſixth, ſeventh and eight ſpine of the *Vertebræ* of the Cheſt.

But we muſt note,that theſe divers actions are not performed by this muſcle, by the aſſiſtance of one only nerve, but by more, which come into it by the ſpinall marrow, by the holes of the *Vertebræ*,as well of the neck as the cheſt, from whence it takes the original. For the two other which are the common muſcles of the blade, and arm, or ſhoulder, we will deſcribe them with the muſcles of the ſhoulder or arm:for one of theſe which is called the *Latiſſimus*,that is,the broadeſt, aſcends from the holy-bone to the ſhoulder-blade and arm.

Latiſſimus.

Pectoralis.

The other the named *Pectoralis* comes from the *Sternon* and collar-bone to the ſhoulder-blade and arm.

CHAP. XX.

The deſcription of the Hand taken in generall.

NOw it befits us to deſcribe in order the muſcles of the arm; but firſt we muſt know, what it is that we call the arm. But ſeeing that cannot fitly be underſtood, unleſſe we know what the hand is, ſeeing that the arm is a part of the hand;therefore firſt we muſt define what a hand is, and then divide it into its parts. Therefore the hand is taken two manner of waies,that is,generally and ſpecially.

What is meant by the hand in generall.

The hand generally taken, ſignifies all that which is contained from the joyning of the arm to the ſhoulder-blade, even to the ends of the fingers.But in particular it ſignifies only that which is comprehended from the furtheſt bones of the cubit, or the beginning of the wriſt, to the very fingers ends.

Therefore the hand in generall is an inſtrument of inſtruments,made for to take up and hold any thing. It is compoſed of three great parts, that is, of the Arm, Cubit, and Hand, vulgarly,and properly ſo called; but the hand taken thus in particular is again divided in three other parts, the *Carpus* or *Brachiale*, the wriſt, the *Metacarpium* or *Poſtbrachiale*, the after-wriſt, and the fingers; all theſe parts (ſeeing each of them are not only organicall parts, but alſo parts of organicall parts) are compoſed of all, or certainly of the moſt of the ſimilar parts; that is, of both the skins, the fleſhy pannicle, the fat veins, arteries, nerves, muſcles or fleſh,coats both common and proper, bones,griſtles,and ligaments, all which we will deſcribe in their order.

The differences of the hand from the ſite thereof.

But firſt I think good to admoniſh you of the differences of the hand taken from the ſite thereof,and theſe differences are ſix in number,the fore,the hind,the internal, the external, the upper and lower ſide or part thereof.

By the fore we mean that part which looks directly from the thumb to the ſhoulder: by the hind,we underſtand the part oppoſite to it, which from the little finger looks towards the baſis of the ſhoulder-blade. By the inſide we ſignifie that part which lies next to the ſides of the body, when the hand retains its naturall ſite;by the outſide, the part oppoſite to it. The upper and lower ſide you may know by the very naming thereof.

Why the hand is divided into ſo many fingers

The hand properly ſo called is divided into five fingers, that ſo it may hold and take up bodies of all figures,as round,triangular,ſquare and the like,and gather up the leaſt bodies with the fingers ends, as needles,pins, and ſuch like.

Why the nails are added to the ſoft fleſh of the fingers.

Nature hath beſtowed two hands upon us, that ſo they may help each other, each moving to each ſide. But for the taking up and holding of ſmall bodies it was fit, that the fingers of their own nature ſoft, ſhould be armed with nails, that conſiſting of ſoft fleſh and an hard nail, they might ſerve for all actions; for the nail is a ſtay to the ſoft fleſh, which otherwiſe would turn away in meeting with an hard body; the uſe of the nails is to ſcratch,ſhave,and pull off the skin, to rend, pinch, and pluck aſunder ſmall bodies.They have not bony hardneſſe, that ſo they might not break but bend.

Why the nails grow continually.

Yet other creatures have hard nails to ſerve them in ſtead of weapons. Their figure is round, becauſe ſuch a figure is leſſe obnoxious to externall injuries; and by reaſon they are ſubject to wearing, they grow continually.

Nature hath placed fleſh on the inner and ſide part of the fingers,ſo to preſſe more ſtraitly, the things they once take hold of,ſo that by holding them cloſe together we can hold water that it may not run out. The length of the fingers is unequall, that when they are opened and ſtretched forth, they make as it were a circular figure;for ſo it comes to paſſe, that the hand can hold all bodies, but eſpecially round.

It remains that we proſecute the diſtribution of the veins,arteries,and ſinews,which run over al the parts of the hand taken in generall and particular,whereby we may more commodiouſly hereafter handle all the proper parts thereof.

CHAP.

CHAP. XXI.

The distribution of the Subclavian vein, and first of the Cephalica, *or* Humeraria.

TWo large veins descend from the Subclavian; the one from the lower side, the other from the higher. Yet sometimes, and most usually, both these proceed from the same common orifice, as in men of a low stature in the arm. The one of these is called the *Axillaris*, the other the *Humeraria*, or *Cephalik*; therefore this Cephalick passing forth of the Subclavian runs superficially along the foreside, between the muscle *Deltoides*, and the Tendon of the pectorall muscle, and descends in the midst between the common coat of the muscles, and the fleshy pannicle, even to the bending of the cubit, where in lean bodies it is plainly to be seen, whereas in fat bodies it is hardly to be perceived, being as it were buried in abundance of fat. This vein having in its descent, sent forth some small branches, both to the skin, as also to certain muscles over which it runs, is divided into two, a little above the outward protuberation of the arm. One of the branches into which it is divided descending obliquely to the fore part of the cubit, a little below the bending of the cubit, it meets, and is united with the like branch in the same place, as shall be shown hereafter.

The Cephalick vein.

That which arises from this concourse, is called the median vein, because it arises from two branches, and is seated between them. They usually open this median vein in the diseases of the head and liver, which require Phlebotomy; but if it shall not be sufficiently manifest, when you judg it must be opened, for a generall evacuation of the whole body; you may cut one of these branches, by whose concourse it is made, which you shall think the fitter; and because each branch draws from the next parts, according to the straightnesse of the fibers, rather then from the opposite side; if you would evacuate the head, and liver equally, by opening either of these branches, it is convenient that opening that branch (for example) which comes from the Cephalick, you presently lay your thumb upon it, untill you suppose you have drawn a just quantity of blood from the liver, by the *Basilica*, or liver-vein; which done, you may take off your thumb, and suffer the blood to follow freely, by the open branch of the Cephalick, untill you have drawn as much blood as you shall judge requisite; otherwise you will draw it but from one part, to wit, the head. So you shall evacuate it only from the liver, if you open the branch which comes from the *Basilica*, and concurs to the generation of the median.

The median vein. How by opening the median vein, you may draw more or lesse blood from the head or liver.

Moreover, when there is need to open the *Basilica*, and it shall be no where conspicuous, the Cephalick or median being easie to be discerned at the same time, you may in stead thereof open the median, or if it be not to be found, the Cephalick, pressing but the trunk thereof with your thumb, as we said before, lest the head should be evacuated in stead of the liver. You may doe the same in the *Basilica*, if when there shall be necessity to open the Cephalick, it shall not appear. Most of those which at this day open a vein, in stead of the median, open that branch of the *Basilica* which ascends together with the Cephalick to make the median. But you must understand that the median descends between the two bones of the cubit, even to the end thereof, and then divided into many branches, it is at length spent on the back of the hand behind the thumb, the fore and middle fingers, or the afterwrist. Sometimes it runs back into the following branch, and then at the wrist it departs from it, to be bestowed upon the forementioned parts. The other branch of the Cephalick, which we may call the fore and outward Cephalick, descending directly down to the midst of the wand, thence wanders overthwart into the hind part of the arm, where encreased with a branch from the *Basilica*, it is distributed over all the back of the hand, which with the median it nourisheth. But the branches of these veins do so run through the forenamed parts, that by the way they yeeld them necessary provision.

CHAP. XXII.

The Description of the Axillary vein.

THe Axillary arising at the insertion of the pectorall muscle, or a little higher, after it hath produced the two *Thoracicæ* it is divided under the tendon of that muscle into two fair branches, that is to say, into the inner deep Axillary, and the skin or outward Axillary. The deep or inner having still for his companion in his descent, the axillary artery, and the nerves of the third conjugation, after it hath produced the small externall musculous of the arm, it goes into the bending of the elbow, where running somewhat deep with the artery and nerve into the muscles of the cubit, it is divided into three other branches, of which one descending with the wand, slides under the ring, into the inner side of the hand, and hath bestowed two small branches on the thumb, two others on the fore, and one upon the middle-finger, so that all of them ascend by the sides of these fingers, the other descending with the artery,

The axillary is divided into the deep axillary, and outward axillary.

as

as the former alongſt the cubit, ſends branches to the reſt of the fingers, like as the former. The third goes on the foreſide between the two bones even to the wriſt, and the ſquare muſcle.

But you muſt note that the veins of which we now treat, do not only make theſe diviſions mentioned by us, but infinite others beſides, as well in the parts which they goe to, as alſo in the inner muſcles of the hand which they nouriſh.

And thus much of the internall and deep axillary vein. For the externall or skin Axillary (which firſt appears under the skin, eſpecially in lean bodies, a little above the inward production of the arm) it is divided in that place into two branches, the one whereof deſcending to the bending of the arm meets, and is united with the Cephalick branch, ſooner or later, that ſo it may produce the median, as we formerly mentioned.

The other branch having ſent forth many ſhoots of a different length and thickneſſe, as well into the skin, as into the other neighbouring parts, deſcending alongſt the lower ſide of the bone of the cubit, properly ſo called, is at length ſpent upon the fore and outward Cephalick branch, which we ſaid deſcendended alongſt the wand; and thus united, they run over all the hand, where in the right hand, between the middle and fore finger, they make the *Salvatella*; but in the left, in the ſame place, they produce the *Splenitica*.

The *Salvatella* and *Splenitica*.

But alwaies remember, (if in diſſection you find any thing otherwiſe than we have delivered it) that the diſtribution of the veſſels is ſo various, eſpecially in the hands) that there can no certain rule be delivered thereof.

CHAP. XXIII.

The Diſtribution of the Axillary Artery.

THe Axillary artery from the firſt originall, which is preſently after the two *Thoracicæ*, deſcending between the muſcle called *Biceps*, or the two headed muſcle, and the *Brachiæus*, with the deep Axillary vein, diſtributes a large branch amongſt the outward muſcles of the arm, which extend the cubit, and is ſpent in the externall muſcles of the ſame, which ariſe without, from the productions of the arm.

And this is called the *Ramus Muſculus*, or Muſculous branch, as alſo the vein that accompanies this arterie. Then this artery when it comes to the bending of the cubit, thruſting it ſelf into the muſcles bending the fingers, communicates certain branches to the parts pertaining to the dearticulation of the cubit with the ſhoulder, and other parts there ſituate, as it did in the upper parts, by which it deſcended hither. Verily it may be a generall rule; that every veſſell ſends or beſtows certain portions thereof by the way to all the parts by which it paſſes. But if you ſhould ask, why I have not proſecuted theſe productions; I would anſwer; I never intended to handle other than large and fair branches of veſſels, by raſh inciſion of which, there may happen danger of death or a diſeaſe. For it would be both an infinit and needleſs buſines to handle all the ſmall devarications of the veins, arteries, and nerves. Therefore this artery ſunk into theſe muſcles, when it comes almoſt to the midſt of the cubit, preſently or a little after it is divided into two large branche, the one of which alongſt the wand, and the other alongſt the cubit is carryed into the hand on the inſide under the Ring. For both theſe branches are diſtributed and ſpent upon the hand after the ſame manner as the branches of the interall Axillary vein, that is, having ſent by the way ſome little ſhoots into the parts by which they paſſe, at the length the branch which deſcends by the Wand of the remainder thereof, beſtows two ſprigs upon the thumb, on each ſide one, and two in like manner on the fore finger, and one on the middle; the other which runs alongſt the Ell, performs the like office to the little and the middle or ring finger, as you may ſee by diſſection.

An Anatomicall Axiome.

CHAP. XXIV.

Of the Nerves of the Neck, Back, and Arm.

NOw we ſhould handle the ſinewes of the Arm, but becauſe theſe proceed from the nerves of the neck and back; I think it fit therefore to ſpeak ſomething of them in the firſt place.

The 7 pair of nerves of the neck.

The firſt pair.

Therefore from the neck there proceeds ſeven pair of nerves, the firſt of which proceeds from the nowl bone, and the firſt *Vertebra* of the neck; as alſo the firſt pair of the Back from the laſt *Vertebra* of the neck, and the firſt of the Cheſt. But all theſe nerves are divided into two or more branches of the firſt pair (that is to ſay, on each ſide) go, the one to the ſmall right muſcle, aſcending from the firſt rack-bone of the neck to the nowl bone, the other to the long muſcle on the foreſide of the neck.

The ſecond pair.

The branches of the ſecond pair are diſtributed, ſome with a portion which they receive from

from the third pair over all the skin of the head; the two others go as wel to the muſcles, which are from the ſecond *Vertebra* to the backpart of the head, and from the ſame to the firſt *Vertebra*, as alſo to the long muſcle before mentioned.

The third pair.

One of the third pair of ſinewes is communicated to the head, as we ſaid before, but others to the Muſcles which extend, or ereſt the head and the neck; there is alſo one of theſe diſtributed into the neighbouring ſide muſcle and part of the long.

The fourth pair.

The nerves of the fourth pair go, one to the muſcles as well of the neck as the head, and to the broad muſcle; the other after it hath ſent ſome portion thereof into the long muſcle and the ſide muſcles of the neck, it deſcends with a portion of the fift and ſixt pair to the Midriffe. One of the branches of the fift pair is beſtowed on the hind muſcles of the neck and head, the other upon the long muſcle and midriffe; the third is communicated to the *Levatores*, or Heaving muſcles of the arm and ſhoulder.

The fift pair.

The ſixt pair.

One of the nerves of the ſixt pair goes to the hind muſcles of the neck and head, another to the Midriffe, the third with a portion of the ſeventh pair of the neck, and of the firſt and ſecond of the cheſt go to the arms and heaving muſcles of the ſhoulder-blade.

The ſeventh pair.

One of the branches of the ſeventh pair runs to the broad muſcle and to the neighbouring muſcles both of the neck and head; another encreaſed with a portion of the fift and ſixt pair of the neck, and a third joyned to the ſecond and third pair of the cheſt deſcending into the arm go to the hand.

But you muſt note that the muſcles which take their original from many *Vertebræ*, whether from above downwards, or from below upwards, admit nerves not only from the *Vertebræ* from whence they take their originall, but alſo from them which they come neer in their deſcent, or aſcent.

The 12. pair of nerves of the cheſt.

There paſſe twelve conjugations of nerves from the rack-bones of the cheſt.

The firſt pair.

The firſt entring forth from between the laſt rack-bone of the neck and the firſt of the cheſt, is divided (that is, on each ſide, each nerve from his ſide) into two or more portions, as alſo all the reſt. Therefore the branches of this firſt conjugation go ſome of them to the arms, as we ſaid before, others to the muſcles, as well theſe of the cheſt, as others ariſing there, or running that way.

The ſecond pair.

The branches of the ſecond conjugation are diſtributed to the ſame parts, that theſe of the firſt were.

The other pairs.

But the branches of all the other conjugations even to the twelfth, are communicated, ſome to the intercoſtall muſcles running within under the true ribs even to the *Sternon*, and under the baſtard ribs even to the right and long muſcles; and the coſtall nerves of the ſixt conjugation are augmented by meeting theſe intercoſtall branches by the way as they deſcend by the roots of the ribs. Other particles of the ſaid nerves are communicated to the muſcles as well of the cheſt, as ſpine, as the ſame muſcles paſſe forth, or run alongſt by the *Vertebræ*, from whence theſe nerves have either their originall, or paſſage forth.

The nerves which are carried to the arms.

Having thus therefore ſhewed the originall of the ſinews of the arm, it remains that we ſhew their number and diſtribution.

Their number is five or ſix; proceeding from the fifth, ſixth, and ſeventh *Vertebra* of the neck, and the firſt and ſecond of the cheſt. The firſt of which not mixed with any other from the fifth *Vertebra* of the neck, goes to the muſcle *Deltoides* and the skin which covers it.

The other 4 or 5 when they have mutually embraced each other, not only from their firſt originall but even to the ſhoulder, where they free themſelves from this convolution, are diſtributed after the following manner.

The firſt and ſecond deſcending to the muſcle mentioned a little before, and thence ſometimes even to the hand, is by the way communicated to the muſcle *Biceps*, and then under the ſaid muſcle it meets and is joined with the third nerve. Thirdly, it is communicated with the longeſt muſcle of the cubit, in the bending whereof it is divided into two branches deſcending alongſt the two bones of the cubit, untill at laſt born up by the fleſhy pannicle it is ſpent upon the skin and inner ſide of the hand.

The third lower than this, is firſt united with the ſecond, under the muſcle *Biceps* then ſtraightway ſeparated from it, it ſends a portion thereof to the arm which lies under it, and to the skin thereof; laſtly, at the bending of the cubit on the foreſide, it is mingled with the fift pair.

The fourth the largeſt of all the reſt, comming down below the third branch under the *Biceps*, with the internall axillary vein and artery, is turned towards the outward and backpart of the arm, there to communicate it ſelf to the muſcles extending the cubit, and alſo to the inner skin of the arm, and the exterior of the cubit; the remainder of this branch when in its deſcent it hath arrived at the joint of the cubit, below the bending thereof it is divided into two branches, the one whereof deſcending alongſt the cubit is ſpent on the outſide of the wriſt; the other aſſociating the wand is on the outſide in like manner in two branches beſtowed upon the thumb, and in as many upon the fore finger, and by a fift upon the middle finger though more obſcurely.

The fift branch being alſo lower than the reſt, ſliding between the muſcles bending and exten-

extending the cubit,when it comes behind the inner protuberation of the cubit(in which place we ſaid before the third Branch meets with this) it is communicated to the internall muſcles of the ſame,and then divided into three portions,one of which on the outſide alongſt the middle of the cubit goes in two ſprigs to the little finger, and ſo many to the middle finger,and one to the ring finger; the other two,the one without & the other within the ring, goe to the hand,where after each of them hath beſtowed what was requiſite on the muſcles of the hand,they are waſted into other five ſmal portions,of which theſe which are from that portion which deſcends without the ring, ſend two ſprigs to the little, two to the fore,& one to the middle finger;but theſe which come from that which paſſes under the ring, by ſuch a diſtribution communicates it ſelf to other fingers,as two ſprigs to the thumb, two to the fore and one to the middle finger. The ſixth the loweſt and laſt runs between the skin and fleſhy pannicle,by the inner protuberation of the arm,and then is ſpent upon the skin of the Cubit.

CHAP. XXV.

The deſcription of the bone of the Arm, and the Muſcles which move it.

The greatneſſe and figure. The Appendix of the Arm. The proceſſes of the arm.

BEcauſe we cannot perfectly demonſtrate the originall of the muſcles of the arm, (eſpecially of the two arm muſcles) not knowing the deſcription of this bone; firſt therefore we will deſcribe it, then return to the originall of the muſcles ariſing from thence. The bone of the arm is the greateſt of all the bones in the body, except the Thigh-bone; it is round, hollow and filled with marrow, with a great Appendix or head on the top thereof,having an indifferent neck, to which it is knit by *Symphyſis*, for appendices are no otherwiſe united to their bones. In the lower part thereof it hath two proceſſes, or protuberations,one on the fore ſide, another on the hind,between which ſwellings there is a cavity like to half the compaſſe of a wheel, about which the cubit is moved. The extremities of this cavity ends in two holes,of which one is the more externall, the other more internall: theſe cavities receive the heads of the cubit, that is, the fore, or internall receives the fore proceſſe when the arm is bended inwards,but the externall or hinder the exterior as it is extended.

For the head of the arm it hath a double connexion,the one with its own neck by *Symphyſis*; that is, a naturall union of the bones without any motion; the other with the lightly ingraven cavity of the ſhoulder-blade,which we call *Glene*, by that kind of ſdearticulation which is called *Arthrodia*; this connexion is made firm and ſtable by the muſcles deſcending into the arm from the ſhoulder-blade, as alſo by the proper ligaments deſcending from the circle and brow of the cavity of the *Acromion* and *Coracoides* to this head of the arm;this ſame head of the arm is, as it were,more cleft and open on the inner ſide,than on the fore ſide, that ſo it may give way to one of the ligaments coming from the ſhoulder-blade to the muſcle *Biceps*. Foraſmuch as belongs to the lower end of the bone of the arm (which we ſaid hath two proceſſes) we may ſay that it is faſtned to the bones of the cubit by two ſorts of articulation; that is, by *Ginglymos* with the Ell or proper bone of the cubit, and by *Arthrodia* with the *Radius* or wand, which in a lightly engraven cavity receives the fore proceſſe of the arm, and is turned about it for the motion of the hand. The hinder proceſſe is chiefly added for the ſafety and preſervation of the veins, arteries and nerves.

The figure of the arm.

Theſe things thus ſhown,it is worth our labour to know the figure of the arm it ſelf, as it lies between the forementioned appendices and proceſſes;that in the caſe of a fracture, we may know how conveniently to reſtore it; therefore firſt we muſt underſtand, that this bone is ſomewhat bended and hollowed on the inſide under the cleft of the head thereof, but bunching out on the out and fore ſide.

The 8 muſcles thereof.

Wherefore ſeeing it muſt be moveable forwards and backwards, upwards and downwards, nature for the performance of ſo many motions hath furniſhed it with eight muſcles, which are ſix proper and two common with the ſhoulder-blade. Of which number two move it forwards, two backwards, two upwards and downwards. Which muſt not be underſtood ſo, as that theſe two muſcles ſhould move it directly forwards inclining neither upwards, nor downwards;and the other two ſhould move it ſo upwards, as it ſhould incline neither forward nor backwards;but thus, that it cannnot be moved neither to this nor that part unleſſe by the help and proper action of this, or that muſcle. Thus therefore if the pectorall with his aſſociate perform their duty or action,the arm is alwaies moved forwards,as it is lifted up by the action of the *Deltoides* and his companion, and ſo of the reſt.

Table 24. sheweth the brain together with the After-brain, the spinall marrow and the nerves of the whole body.

A, That part of the brain that is next the nostrils.
B, That part which is at the side of the ventricles.
C, The back part of the brain.
D, The *Cerebellum* or After-brain.
E, The mamillary processe in the right side.
F, The originall of the optick nerve.
G, Their conjunctions.
H, The coat into which the optick nerve is extended.
I, The second pair of the sinews of the brain.
K, The lesser roor of the third conjugation.
L, The thick roor of the same conjugation according to the common opinion.
M, The fourth conjugation of the sinews.
N, The lesser roor of the fift pair.
O, The bigger roor of the same pair.
P, The small membrane of the ear which they call the *Tympany*.
Q, The lower branch of the bigger roor of the fift conjugation.
S, The sixt pair of sinews.
T, The seventh pair.
V, The beginning of the spinall marrow out of the middle of the basis of the brain.
X, The right sinew of the midriffe cut off.
Y, A branch from the fift pair creeping to the top of the shoulder.
Z, The first nerve of the arm, from whence there goeth a branch to the skin.
A, The second nerve of the arm, and a branch therefrom into the first muscle of the cubit.
B, The third nerve of the arm and a branch going to the skin on the outside.
C, A branch from the third nerve to the second muscle of the Cubit.
D, The congresse or meeting of the second nerve with the third.
E, A small branch from the third nerve to the second muscle of the *Radius*.
F, The distribution of the second nerve into two branches.
* The lesser branch of this division lengthned out to the skin as far as the thumb.
a, The place of the spinall marrow where it issueth out of the brain 1, 2, 3. &c. Thirty pair of nerves arising from the spinall marrow are here noted by their Char. that is to say, 7. of the neck, 12. of the Chest, 5. of the loins, and 6. of the holy-bone.
b, The thicker branch of the 2 nerve divided into 2 parts.
c, Branches of the 3 nerve sprinkled here and there.
d, Nerves from the third pair to the thumb, the fore finger and the middle finger.
ee, The 4 nerve of the arm. *f*, The passage hereof through the inside of the shoulder.
g, A tripartition of this branch where it toucheth the cubit. *hh*, A branch distributed from the 4 nerve to the outward skin of the cubit. *i*, the upper branch of the division of the 4 nerve. *kk*, A branch of *i*, reaching to the outside of the hand. *ll*, the lower branch of the division of the 4 nerve passing through the backside of the cubit. *m*, the fifth nerve of the arm. *n*, branches of this nerve dispersed here and there. *oo*, A branch of the 5 nerve reaching to the inside of the hand and the fingers. *p*. A furcle of the branch *o*, derived to the outside of the hand and the fingers. *qq*, the 6 nerve of the arm and the course thereof under the skin. *rr*, the intercostall nerves there cut off where they are together with the ribs reflected forward. *ſſ*. branches on each side running backward. *tt*, nerves attaining unto the chest. *uu*, the commixtion of the nerves *rr*, with the descending branch of the 6. conjugation of the brain. *xx*, nerves from the loins led unto this place. *y*, A branch going to the testicle here cut off. *ζ*, A nerve reaching to the 1 muscle of the thigh. *e*, the 1 nerves of the leg. *αβ*, A furcle of the former nerve derived to the skin at *α*, and inserted into the muscles at *β γ*, the 2 nerve of the leg. *δδδ*, A nerve from the former, allowed unto the skin as low as to the foot, and passing along the inside of the leg. *ε*, a branch of the 2 nerve running unto the muscles. *ζ*, the 3. nerve of the leg. *η*, a furcle thereof unto the skin. *θ*, another furcle unto the muscles. *ι*, the 4 nerve of the leg. *κκ*, the *anterior* propagations of the nerves proceeding from the holy-bone. *λ*, muscles. *μ*, the 4 nerve of the leg. *νν*, the *anterior* propagations of the nerves proceeding from the holy-bone. *λ*, the end of the spinall marrow. *μ*, a branch from the 4 nerve inserted into the muscles arising from the *Coxendix* or hip bone. *ρ*, another branch going to the skin of the thigh on the backside. *ξ*, a propagation derived to the 4. *σσ*, the muscle of the leg and to the skin of the knee. *ττ*, nerves attaining to the heads of the muscles of the foot. *σσ*, the division of the 4 crurall nerve into two trunks *σ*, a branch from the trunk *π*, dispersed into the outward skin of the leg. *τ*, a furcle of the trunk *π*, derived to the muscles. *υ*, another furcle to the skin of the leg on the foreside. *φ*, a branch of the trunk *ρ*, to the skin of the inside of the leg and of the foot. *χ*, a furcle of the trunk *ρ*, to the hindmost skin of the leg. *ψ*, a branch of the whole trunk *ς*, led along to the forward part of the leg and the foot. *ω*, the descent of the trunk *ρ*, into the foot.

But to come to the originall and insertion of these muscles; the one of these two which move the arm forwards called by reason of his originall, the Pectorall, arising from more than

The originall and insertion of the pectorall muscle.

than half of the Collar bone,and almoſt al the *Sternon*,and the 6,7,and 8. rib, goes up and faſtens it ſelfe to the *Coracoides*,by a membrane or a membranous tendon ſufficiently ſtrong (for which cauſe it is ſaid to be common to the ſhoulder and arm) and it goes into the arm between the muſcles *Deltoides* and *Biceps* with a ſtrong tendon compoſed of fibers croſſing each other,of which ſome deſcend from the Collar-bone and the upper part of the *Sternon*,others aſcend from the lower originall hereof; that is,from the 6,7,and 8 ribs:and although the action of this muſcle be diverſe,by reaſon of the diverſity of its fibers ariſing from divers places, yet alwaies it drawes the arm forwards, whether it be moved upwards, downwards, or to the Breſt; the other which is his companion deſcends from the whole ſip or brow of the ſinous or hollow part of the blade,which it fills in the forepart of the arm neer the head thereof. For the two *Levatores*,or the lifters up of the arm, the firſt named *Deltoides* deſcends from almoſt halfe the clavicle, the proceſs *Acromion* and all the ſpine of the ſhoulder-blade into the foreſide of the arm the bredth of four fingers below the joint. It hath divers actions according to the diverſity of the fibers, as alſo every muſcle hath; yet howſoever it is contracted, whether by the fibers from the clavicle alone, or by the ſpinall alone, or by both at once, it alwaies lifts and heaves the arm upwards. The other which is his aſſociate deſcends from the gibbous part of the ſhoulder-blade, contained between the upper rib thereof, and the ſpine between the proceſſes *Acromion* and *Coracoides*, to the neck of the arm;and this we wil call the *Epomis* or *Scapularis*;that is,the ſhoulder muſcle. But the firſt and larger of the two muſcles,which draw the arm backwards, ariſes from the greateſt part of the utter lip of the gibbous part of the ſhoulder-blade, which is under the ſpine thereof, and lying upon the blade it ſelf, it goes into the hind part of the arm above the neck thereof. The other which is contiguous to it and his partner in working, but leſſer, paſſes from the upper and exterior part of the lower rib of the ſhoulder-blade,and thence as it were in ſome ſort extending it ſelf upon the gibbous part thereof neer unto that rib,it goes into the arm. This muſcle ſeems to be the ſame with the former, being fleſhy without even above the top of the ſhoulder. One and the leſſer of theſe two which draw downwards, enters out from the ſtreight line of the lower rib of the blade, and goes into the lower part of the arm about the neck thereof. The other called the *Latiſſimus* or broadeſt,aſcends from the ſpines of the holy-bone, of the loins, and often alſo from the nine lower of the cheſt,by the lower corner of the ſhoulder-blade into which is inſerted by a membranous tendon,as alſo it is into the inner part of the arm neer unto neck by another ſtrong tendon; whereupon this muſcle is called a common muſcle of the ſhoulder and arm. But when this muſcle happens to be wounded,the arm cannot eaſily be ſtretched forth, or lifted up.

The *Deltoides*.

The *Epomis* or *Scapularis*.

CHAP. XXVI.

The deſcription of the bones of the Cubit and the muſcles moving them.

AFter theſe muſcles,follow thoſe which bend and extend the cubit, but becauſe their inſertion cannot be fitly demonſtrated, unleſſe the bones of the cubit be firſt deſcribed;therefore firſt of all we will delineate the bones themſelves. But verily leſt this doubtful word cubit ſhould cauſe obſcurity;firſt we muſt note,that it hath a threefold ſignification,for ofttimes it is uſed for all that part of the hand which lies between the arm and wriſt,oft-times for the lower bone of this part,ſometimes for the upper part of this bone which is turned within the orb or cavity of the arm (no otherwiſe than a cord in the wheel of a Pulley) and this is called the *Olecranon*. Here truly we uſe this word Cubit in the firſt ſignification. Wherefore we ſay the cubit is compoſed of two bones, the one of which we cal the *Radius* or wand,or the leſſer *Focile* of the arm;the other we properly cal the Cubit or El. Theſe two bones ſtick together at their ends being firmly bound together by ſtrong ligaments;but the middle parts of them are a prety way diſtant from each other,and chiefly towards their lower ends, for the better ſituation and paſſage of the muſcles and veſſels from the inner ſide to the exterior, as ſhall be ſhewed in fit place. The wand hath two *Epiphyſes* or Appendices,the one at the upper end, the other at the lower. The upper is round and hollowed on the ſurface like a baſon,it receives the fore proceſſe of the bone of the arm,bouud to the ſame by ſtrong ligaments, deſcending as well from that proceſſe of the arm, as the *Olecranon* into the circumjacent parts of this appendix of the wand. This connexion is made for this uſe,that we may turn our hand upwards and downwards by the cubit turned and twined about this proceſs. But the lower appendix of this wand is hollowed on the inſide that ſo it might more commodiouſly receive the bones of the wriſt,but gibbous without,that it might be ſafer;now this wand is ſofter and thicker at the lower end,but leſſer and harder above,where on the inſide it hath a ſwelling out,whereby to receive the muſcle *Biceps*, beſides on the outſide of the middle thereof it is ſomewhat gibbous and round,ſo to become more ſafe from the injuries of external bodies; but it is hollowed,or bended on the inſide for the better taking and holding any thing in the hand. But that ſide which lies next to the Ell is flatted for the fitter originall and ſeat of the muſcles;laſtly,it is ſeated upon the bone of the Cubit, or Ell,juſt againſt the thumb.

What is meant by the Cubit.

What the *Olecranon* is.

The 2 bones of the Cubit.

The two Appendices of the wand.

The figure and ſite of the wand.

But

But the Ell, or bone of the cubit properly aud particularly so called, hath in like manner two appendices, the one above, the other beneath. The upper which also is the greater, is fitted to the orb of the arm in which it goes to and again for the extension and bending of the arm, no otherwise than a rope runs in a pulley but that it turns not absolutely and perfectly round, which is caused by the two processes of unequall bignes, the which are therefore stayed in the holes or cavities of the bone of the arm, the greater processe which we called *Olecranon* is letted by the exterior hole that so the extension of the arm can be no further, but the lesser processe by the inner hole, makes the bending thereof the lesse perfect. The composure of these bones is by *Ginglymos*, and it is strengthned not only by common ligaments comming from the muscles, which move the bones themselves, but also by proper ligaments descending from the processes of the arm and the lips of the holes and cavities standing about the appendix of the cubit. The other lower and lesser appendix is in some sort hollow on the inside for the fitter receiving the bones of the wrist, but the outside is round and ends in a point, whence it is called by the Greeks *Styloides*. But now this Ell (contrary in this to the wand) is thicker towards the arm, but slenderer towards the wrist. And besides in the thicker part thereof it is hollowed or bended towards the inside, and in the same place is gibbous or bunching forth on the outside; but it is round and streight, unlesse on that side which lies next the wand, for the rest, it is hollow and full of marrow like the wand. The site of the *Radius* or wand is oblique, but that of the cubit or Ell is right, that the arm might be the better and more easily moved; because the motion by which the arm is extended and bended is according to a right line, but that by which the inside of the hand is turned upwards and downwards, is performed obliquely and circularly. Wherefore it was expedient that the wand should be oblique, and the cubit streight; for the cubit-bone is appointed for to extend and bend the arm, but the wand to perform the wheeling and turning about thereof; and this is the cause that it was fitting there should be a different connexion of these bones with the arm. These things were fitting to be spoken concerning the nature of these bones, that in the cure of fractures we may work the more safely and happily, taking indication from that which is agreeable to nature: wherefore now it remains that we come to the description of the muscles which are seated in the arm, the cubit-bone, or Ell. These are four in number, two extending it, and two bending it. The first of the benders is called *Biceps*, by reason of its two heads, the one whereof descends from the *Coracoides*, that other from the lip of the cavity of the shoulder-blade by the fissure or clift of the head of the bone of the arm. These two heads under the neck of this arm becoming fleshy, are firmly united at the belly and midst of the arm, and thus united are at the length implanted by a strong tendon to the inner protuberation of the wand. The other is called the *Brachiæus*, by reason of the strait coherence thereof with the bone of the arm; this fastned under the *Biceps* descends obliquely on the back and upper part of the bone of the arm into the top of the wand and the inner side of the Ell. But the first of the extenders is called the *longus* or long muscle, this descends from the lower rib of the shoulder, and cleaving to the bone of the arm goes thither (fastned and as it were alwaies most straitly joined with his fellow muscle, specially neer the cubit) where you shall presently hear. The other termed the *Brevis* or short Muscle, being the companion of the long, descends on the hind part of the neck of the bone of the arm, as it were growing to, and lying under the former long muscle, so that making one common broad tendon outwardly fleshy, inwardly nervous, they are inserted into the *Olecranon*, so by mutuall assistance to extend the cubit.

The Appendices of the bone of the cubit.

The figure of the cubit bone or Ell.

The muscles moving the cubit.

The *Biceps*, or two-headed muscle.

The *Brachiæus*.

The *Longus*.

The *Brevis*.

CHAP. XXVII.

The Description of the Bones of the Wrist, Afterwrist and Fingers.

WE said before that the Hand taken more particularly and properly, is divided into the Wrist, Afterwrist, and Fingers, and that the hand in this signification is bounded by the ends of the bones of the cubit and fingers. All the parts of the wrist, which it hath common with the afterwrist, have been already also plentifully explained, this only remains to be noted, that the skin as well of the hands as of the feet, is of a middle nature between pure flesh and pure skin, no otherwise than that which covers the forehead, but that this which covers the palms of the hands and soles of the feet is unmoveable; but it is most thick, especially on the feet, lest it should be easily offended by continuall going. Besides the common parts, the wrist is composed of eight smal bones mutually knit together in a certain order, and by *Diarthrosis* with the two bones of the Cubit, but mutually and amongst themselves by *Synarthrosis*, by interposition of gristles and ligaments as well common, that is, coming from the muscles, as proper, descending alwaies from the upper to the lower. But these same bones are some lesse than othersome; besides, they are hard and without marrow, gibbous on the outside for the security and comlinesse of the hand, but hollow on the inside for to give way to the tendons going into the fingers. These bones are disposed in two ranks.

What the Hand properly so called is.

The firſt rank contains only three, but the ſecond five. The three of the firſt rank are thus arrayed, or placed, that one of them may receive the Appendix *Styloides*, of the cubit; the other the Ell and the wand together, aud the third may be received by the wand. But three of the five bones of the ſecond order ſuſtain the four bones of the afterwriſt and are knit to the ſame by *Synarthroſis*, after which manner of connexion they are joined to the bones of the firſt rank; the fourth ſuſtains the firſt bone of the thumb, to which alſo it is coarticulate by *Synarthroſis*; the fift and laſt is ſeated on the inſide againſt the Ell, chiefly above that bone of the firſt order, which receives the Appendix *Styloides* of the cubit, this is the leaſt and weakeſt of them all by reaſon of its griſtly ſubſtance, which makes the ring with certain ligaments running from one of the inner ſides of the wriſt to the other.

What the *Antilia* or ring is.

This ring is placed there, as well for the preſervation of the ſinews, veins, and arteries paſſing under it (leſt when we lean upon our hand or wriſt, theſe parts ſhould be hurt by compreſſion) as alſo for the commodity of the action of the muſcles bending the finger, which in the performance of their action and the contracting themſelves might deform the hand by their paſſing forth of the cavity of the wriſt. For what attraction ſoever is made by ſtrings, if it be free and not hindred, is according to a ſtreight line.

The bones of the Afterwriſt.

Now follow the bones of the ſecond part of the hand, or of the afterwriſt. Theſe are four in number, gibbous without, but arched within, or hollow in the middle; for hence is the palm of the hand, or certainly the greater part thereof; their ends next the fingers are ſomewhat remote from each other, that in theſe clifts the muſcles *Interoſſes* might find a place and ſeat. But theſe ends have each an Appendix, as you may perceive in the Sceleton of a child. But you muſt note that by the firſt bone of the wriſt or afterwriſt, wee mean that which is in the foreſide of the hand, that is to ſay, that in the wriſt which lies under the thumb, and that in the afterwriſt, which is ſeated under the fore finger, as theſe which keep in order the fingers which exceed the reſt in neceſſity and dignity.

The Figure of the bones of the Hand. The 1. *ſhews the inſide of the right hand, and the* 2. *ſhews the back ſide of the ſame.*

FIG. I.

FIG. II.

The Charact. 1, 2, 3, 4, 5, 6, 7, 8. ſhew the eight bones of the wriſt.

A, 1, 2. The firſt bone of the Afterwriſt lying under the thumb.

I. II. III. IIII. The 4 other bones of the Afterwriſt annexed to the fingers.

B, *C*, The two bones of the thumb.

D, *E*, *F*. 1, 2. The 3 bones of the forefinger which are the ſame in the other fingers.

M, 1, 2. A little bone ſometimes faſtned outwardly at the joint of the eight bone of the wriſt.

N, 1. A proceſſe of the eight bone of the wriſt, ſwelling out into the ball of the hand.

O, 1. A proceſſe of the fift bone of the wriſt, from which a ligament proceeds.

P, 2. An appendix of the bones of the wriſt, by which they are articulated to the afterwriſt.

Q, 2. Another Appendix which with its head entreth into the cavity of the finger.

R, 1, 2. The ſpace between the bones of the afterwriſt.

S, 1, 2. Two little ſeed-bones ſet on the inſide and outſide of the firſt joint.

T, 1. Two ſeed-bones in the firſt of the four fingers.

VV, 1. One ſeed-bone in the ſecond and third joint of the fingers.

The bones of the fingers.

After theſe follow the fifteen bones of the fingers; that is, three in each, which are hollow and fiſtulous, full of a thin and liquid marrow, and not of groſſe and thick, as in the arm and thigh. They are outwardly gibbous, but inwardly hollow and flat for the fitter ſeat of the tendons aſcending alongſt the fingers on the inſide even to the upper joint. The which that nature might the better ſtrengthen and preſerve, it hath produced from the lips of the inner cavities of theſe bones a membranous and ſtrong ligament, which running overthwart from one ſide to the other doth ſo ſtraitly cloſe the tendons to their bones, that they cannot goe forth of their places, or incline to either ſide. They are connexed on the outſide, that they might be more fit to hold any thing. But for the firſt bones of the 4 fingers and thumb, four are joined together with ſo many bones of the afterwriſt by *Synarthroſis*, for the bones of the afterwriſt are moved by no manifeſt motion; the fift is knit to the ſecond rank of the bones of the wriſt, therefore that bone cannot be attributed to the

after-

afterwriſt, as ſome have written, ſeeing it hath manifeſt motion and is knit by *Diarthroſis*, but the bones of the afterwriſt are only faſtned by *Synarthroſis*. For the ſecond and third rank of bones of the fingers, they are knit the ſecond to the firſt, and the third to the ſecond by *Diarthroſis* and *Arthrodia*, becauſe beſides the manifeſt motion they have, they receive each other by a ſuperficiary cavity, as thoſe of the firſt rank, the bones of the afterwriſt, and thoſe of the ſecond rank, them of the firſt; thoſe of the third them of the ſecond. And al the bones of the fingers are larger and thicker at their baſis, but ſmaller towards the ends, and they are bound by ligaments eſpecially proper, which (as we ſaid formerly) deſcend from the firſt to the ſecond; ſo that the laſt bones ſeeing they have not to whom to communicate their nerve, make and produce nails thereof: Wherefore the nails are generated by the fibers of the ligaments, and the excrement of the tendons which are terminated at the bottom of the nails. Now remain the *Oſſa Seſamoidea*, or ſeed-bones: theſe are 19 in number in the inner joints of each of the hands, and as many in each foot, *viz.* two in the firſt joint of the four fingers and in the ſecond of the thumb, and one in each of the reſt. For the inner ſide of the joints, you may for the moſt part obſerve one in each of them; yet in the ſecond joint of the thumb there be two, above the two tendons, which are ſomewhat griſtly.

Whence the nails are generated.

The *Oſſa Seſamoidea*, or ſeed-bones.

They are made for this uſe, that they firm and ſtrengthen the joints, ſo that the bones of the fingers may not be turned awry, or thruſt forth of their places by ſtrong and violent motions, as it ſometimes happens in the whirlebone of the knee. They are called *Seſamoidea* from the reſemblance they have to the ſeed of *Seſamum* which is ſomewhat long and flat.

Their uſe.

CHAP. XXVIII.

Of the muſcles which ſeated in the cubit move the Wand and with it the Hand.

NOw muſt we deſcribe the muſcles of the formerly deſcribed parts; that is, thoſe which are ſeated in the cubit, which are carryed to the inſide of the hand, and thoſe which are called the *Interoſſes*. Now the muſcles of the cubit are 14, ſeven externall and ſeven internall; two of the ſeven externall doe primarily twine or turn up the Wand, and ſecondarily or by accident turn the palm of the hand upwards, whereupon they have called them *ſupinatores* or turners up of the hand; two extend the wriſt, whereupon they are named *Carpitenſores* or the wriſt-extenders; two the fingers, whence they are ſtiled *Digitumtenſores* or fingerſtretchers; to conclude, the ſeventh and laſt is termed *Abductor* or *Obliquator externus*. The firſt of the two *ſupinatores* is called the Long, or Longeſt, becauſe it deſcends from the outſide of the arm above the proceſſes thereof, and is inſerted by a round and ſtrong tendon into the lower Appendix. The other deſcends obliquely from the outward and upper proceſſe of the arm, and is inſerted at the third part of the wand by a membranous and fleſhy tendon before and on the inſide thereof. The upper of the two extenders of the wriſt, deſcending above the wand from the external and upper proceſſe of the arm, is inſerted by two tendons into the firſt and ſecond bone of the afterwriſt, which ſuſtain the fore and middle fingers.

The muſcles of the cubit.

The *Supinatores*.

The *Carpitenſores*.

The *Digitumtenſores*.

The *Obliquator externus*.

The firſt of the *Supinatores*.

The ſecond.

The upper of the *Carpitenſores*.

The other and lower, deſcending from the ſame place as the former, above the cubit is inſerted into the fourth bone of the afterwriſt which bears up the little finger. Theſe muſcles whileſt they move alone, that is, each with his Antagoniſt, to wit, the wriſt-benders, they move obliquely upwards or downwards, the whole hand properly ſo called. The firſt and greater of the extenders of the fingers, or finger-ſtretchers ariſing from the *Olecranum*, or bone of the cubit, deſcends ſuperficiarily between the two bones of the cubit even to the wriſt, in which place it is divided into four tendons, which paſſing under the ring ſeated there end (each diſtinguiſhed by a common ligament above the bone of the afterwriſt) in the laſt joints of the four fingers, adhering neverthele ſſe firmly to the bones, which are above theſe joints.

The lower.

The greater of the *Digitumtenſores*.

The other which is the leſſer, ariſing almoſt in the middle of the wand, goes obliquely to the thumb into which it is inſerted by two tendons; the one thicker which is inſerted into the root thereof, and draws it from the other fingers; the other ſlenderer continued even to the upper joint thereof, and by its action extending the thumb.

The leſſer.

The ſeventh which is the *Abductor* or *Obliquator*, is ſeated at the hind part of the hand; that is, towards the little finger; we have often found this divided in two, yea verily we have found it triſide, or divided into 3. this year in three or four dead bodies, one portion thereof went to the lower ſide of the ring-finger with two Tendons, the other in like manner to the middle and forefingers, and the third to the thumb.

The *Obliquator* or *Abductor externus*.

And for all that it is thus divided, yet ſome have taken and accounted it for one muſcle, becauſe it hath one originall and action, which is to draw the fingers backwards, ſome have added to this the extender of the thumb by reaſon of their common originall; and thus of four muſcles they have made one divided into ſeven tendons, diſtributed, as is formerly ſhewed. But when the *Obliquator* of the ring-finger is wanting, as it often happens, the extender of the finger ſupplies that defect by certain productions of tendinous ſtrings. But ſome alſo have written, that this muſcle which we ſaid hath ſeven tendons,

is only a production of the deep fore muſcle, which ſhould be ſent through the ſpace between the bones of the cubit; yet I had rather make it a muſcle of it ſelf, by reaſon of its ſtrait adheſion with the bones of the arm and wand. And let thus much ſuffice for the external muſcles of the cubit, which you may comprehend in the number of ſeven, as we have done; or in ſix, if you take away one of the 4. or in nine, if you had rather reſolve it into 4. with *Galen*; or in eight, if you divide this muſcle only into three. For in very deed the *Abductor* or *Obliquator* of the ring-finger is not often found in men.

The muſcles of the inner part of the cubit.

Now muſt we come to the inner muſcles of the cubit, the firſt of which compaſſes the skin of the palme of the hand, whence it is called the *Palmaris*. The ſecond and third joined by the communion of their action turn down or prone the wand, and conſequently the hand, ſo that the palme looks towards the feet, whereupon they are called *Pronatores*.

The *Palmaris*.

The 4. and 5. joined alſo in affinity of action bend the wriſt, wherefore they are named *Carpiflexores*, wriſt-benders. The ſixt and ſeventh are appointed to bend the firſt, ſecond, and third joints of the fingers, wherefore they are termed *Digitumflexores*, *Fingerbenders*. For their originall; the *Palmaris*, the leaſt and uppermoſt of them all, deſcends fleſhy from the hind proceſſe of the inner arm, and a little after ending in a long and ſlender tendon, it is ſpent in the skin of the palm of the hand even to the roots of the fingers. For it was neceſſary that this skin ſhould ſtraitly cohere with the ſubjacent parts, not only for the fitter taking or comprehenſion of any thing, leſt that skin in holding ſhould be wrinckled and drawn away from the palme and fingers, and ſo be an impediment; but beſides that the hand might have a more exact ſenſe to diſtinguiſh of hot, cold, moiſt, dry, ſmooth, equall, rough, ſoft, hard, great, little, and ſuch other qualities. Then follow the two *Pronatores*, of which one called the round, comes obliquely from the inner ſide of the hind proceſſe of the arm almoſt to the middle of the wand, to whith it adheres by a membranous and fleſhly tendon, even to the place appointed for inſertion. The other ſquare three or four fingers broad, yet ſomewhat ſlender, ſeated within under all the muſcles which deſcend on the inſide to the wriſt or fingers, upon the ends of the bones of the cubit, aſcends tranſverſe from below the Ell, unto the top of the wand, where it ends in a membranous tendon.

The *Pronatores*.

The *Carpiflexores*.

Both the *Carpiflexores*, or wriſt-benders, ariſe from the hind, but inner proceſſe, and deſcend obliquely, (the one more, or leſſe than the other) the one alongſt the Ell, but the other alongſt the wand; and that which deſcends alongſt the Ell, is inſerted into the eight bone of the wriſt, which we ſaid made part of the ring; the other which followes the wand is inſerted with his greater part into the bone of the wriſt, and with the reſt into the firſt bone of the after-wriſt which ſuſtains the fore finger.

The Digitumflexores. The *Sublimis Digitumflexor*.

Now remain the *Digitumflexores*, or Fingerbenders, which becauſe they lye upon one another, the upper is called the *Sublimis*, but the lower the *Profundus*. The *Sublimis* or upper, ariſing from the inner part of the hind proceſs of the arm, and from the upper parts of the Ell and wand, deſcends between theſe two bones of the cubit even to the wriſt and ring; divided into 4 tendons it is inſerted into the ſecond dearticulation of the four fingers, which it bends by the force of this his proper inſertion; as alſo the firſt, as well by the power of the common ligament, as by certain fibers coming from it, which it ſends thither by the way in its paſſage. But theſe 4 tendons neer unto this their inſertion are divided into two, ſo to give paſſage and add ſtrength to the tendons of the deep muſcles deſcending into the third and laſt joint of the fingers.

The *profundus Digitumflexor*.

But this ſame *Profundus* or deep muſcle ariſing from the upper and inner parts of the Ell and wand, deſcends between theſe two bones under the *Sublimis*, alſo undivided even to the wriſt, where it is divided into 5 Tendons which it brings forth under the common ligament, and the diviſions of the tendons of the *Sublimis* even to the laſt joint of the fingers, which they bend, by this their proper inſertion, as alſo the bones of the firſt and ſecond joints of the fingers by the means of the common ligament and fibrous productions which they beſtow upon them by the way. Beſides theſe forementioned there is ſeen alſo a certain membranous ligament which engirts the tendons in the compaſſe of the fingers.

CHAP. XXIX.

Of the Muſcles of the inſide of the hand.

The number of the muſcles of the inſide of the hand.

THe muſcles of the inſide of the hand are 7 in number; the firſt is called *Thenar*, becauſe it makes the greater part of the Palme; the ſecond from the ſite is called the *Hypothenar*; the third the externall *Abductor* of the thumb. The four other are called by reaſon of their figure the *Lumbrici* or wormy muſcles, or the *Abductores*, or Drawers of the four fingers to the thumb. Now the firſt called *Thenar*, thicker than the reſt, ariſes from all the bones of the afterwriſt, taking its beginning from that bone which bears up the ring finger, whence aſcending alongſt the Vitall line even to the end thereof at the firſt bone of the afterwriſt ſuſtaining the fore finger, and it is at length inſerted into the laſt joint of the thumb by the longeſt fibers, but by the

The *Thenar*.

middle

middle and ſhorteſt fibers almoſt into all the inner part of the firſt bones of two joints, and by reaſon of this, the thumb is drawn to the other fingers, and from them again by his lower originall.

Some divide this muſcle into three, by reaſon of his divers actions, making the firſt to ariſe from the root of the bone of the afterwriſt which bears up the ring finger; but the other from that middle bone of the afterwriſt which ſuſtains the middle finger; but of the third, from the upper end of that bone which underprops the fore finger, and that the inſertion of them all, is, as we formerly mentioned. But the former opinion likes me better, both for ſhunning confuſion, and abbreviating the doctrin of the number of muſcles.

The *Hypothenar* ariſes from the fourth bone of the afterwriſt, and that bone of the wriſt which ſuſtains it, and then with its longeſt fibers, it is inſerted into the ſecond joint of the ring finger, and by the ſhorteſt into the firſt, through which occaſion, as alſo in reſpect of its twofold action, ſome have divided it into two, that the one of them might lead it from the reſt, and the other might draw it to the thumb. — The *Hypothenar*.

The third the externall *Abductor* of the thumb, deſcends from the firſt bone of the afterwriſt, into the firſt and ſecond joint of the thumb, wherefore ſome have divided it into two. The *Lumbrici*, or four externall *Abductores* of the fore fingers ariſe from a membrane, inveſting and binding together the tendons of the *Digitum flexores*, or fingerbenders, and at length on the ſides towards the thumb even by a ſmall tendon, running even to the ſecond joint of the four fingers, — The externall *Abductor* of the thumb. The *Lumbrici*.

Now the *Interoſſes* of the afterwriſt, remain to be ſpoken of; theſe are ſix, two in each of the ſpaces between the fingers, one internall, the other externall, of which the internall deſcending with oblique fibers from the ſide of the firſt bone of the afterwriſt, goes alſo into the ſides of the fingers, that ſo it may the more cloſely bind together the bones of the afterwriſt, whoſe action is manifeſted when we thruſt our fingers into a ſtrait glove, or when we bend our hand. Some think that it helps alſo the drawing of the fingers towards the thumb. The externall aſcends alſo by oblique fibers from the ſides of the ſecond bone of the afterwriſt, to the firſt joints of the fingers, interſecting the internall which we now deſcribed after the manner of the letter X, for to extend the palm of the hand, and help the drawing away of the fingers from the thumb. — The *Interoſſei*.

Here concluding the deſcription of the muſcles of the whole hand taken in generall, you ſhall note that they are 39. in number, that is, eight appointed to move the arm; four ſet to move the cubit in generall; ſeven ſeated on the outſide of the cubit, and as many on the inſide in the ſame cubit, moving the wand, and with it the hand; ſeven on the inſide of the hand: and laſtly, the ſix *Interoſſes*. Some encreaſe this number, ſaying, there are nine on the externall part of the cubit, and eleven on the inſide of the hand. — The number of the muſcles of the whole taken in generall.

CHAP. XXX.

A Deſcription of the Leg taken in generall.

AFter the hand followes the deſcription of the Leg. Wherefore to take away all doubtfulneſſe, we will firſt define the leg; then divide it into the parts more and leſſe compound; thirdly, we will proſecute all things common to all theſe parts; fourthly, thoſe which are peculiar to each; and then, God willing, we will give an end to our Anatomy.

Now this word *Crus*, or leg, is uſed two manner of wayes, that is, either generally or ſpecially, and ſpecially again after two ſorts, that is, either abſolutely and ſimply ſo, or with an adjunct. It is ſimply taken for all that which is between the knee and the foot. But with an adjunct for the greater bone thereof. But the leg taken in generall, is the inſtrument of going, containing all whatſoever is from the hips, to the very ends of the toes. It is divided into three great parts, that is to ſay, the thigh, the leg, or ſhank, and the foot. By the thigh we mean that which lies between the hip and the knee. By the leg, properly ſo called, or ſhank, that which is contained between the knee and the foot. By the foot all from thence to the ends of the toes. — The diverſe acception of the leg. The thigh. The leg or ſhank. The foot.

Again, they divide the foot into three parts; that is, the *Tarſus* or inſtep, the *Pedion* or top of the foot, and the *Digiti pedum*, or toes. We underſtand by the inſtep, that which is contained in the firſt ſeven bones, which anſwers in proportion to the wriſt of the hand. By the top of the foot, that which is comprehended in the five following bones, which is anſwerable to the afterwriſt. That which remains, we call the toes. But becauſe all theſe parts have other common and proper parts, we will only follow the diſtribution of the veins, arteries, and nerves; ſeeing we have ſufficiently explained the reſt, when we deſcribed the containing parts of the body in generall. — The diviſion of the foot. The inſtep. The top of the foot. The toes.

CHAP.

CHAP. XXXI.

A Deſcription of the Crurall vein.

The beginning of the Crurall vein. The two branches thereof.

THe crurall vein begins then, when the hollow vein paſſing forth of the *Peritonæum*, and ſtretched to the hanch bone, and the ſides of the *Pubis* in the groin, is firſt divided into two large branches, the one of which deſcends on the inſide, alongſt the bones of the whole leg, together with the artery and nerve; the other runs down outwardly and ſuperficially alongſt the leg, between the fat lying under the skin, and the muſcles even to the foot, and is ſpent in the skin thereof. This becauſe it is alwaies apparent and manifeſt, is called properly by the Greeks *Sapheia* but commonly *Sephena*.

By what veins, the matter cauſing thoſe tumors called *Bubones* flow down.

This vein by the way preſently at its originall is divided into two branches, the one internall, the other externall; of which the internall is ſpent upon the *Bubones*, and other glandules of that place and the skin, and by this branch come the defluxions called *Bubones*; the other branch is waſted in the fore and utter skin of the upper part of the thigh; then a little lower, that is, about the bredth of three or four fingers, it is gathered again into one branch made of many little ones, which is ſpent in the fore and hind skin of this thigh. Thirdly, a little below the middle of the thigh it is again divided into two other branches, of which the one goes into the skin on the foreſide, and the other on the hindſide. Fourthly, it is diſtributed by two other ſmall ſprigs into the skin, on the fore and hind part of the knee; whith oftentimes are not found, eſpecially when the *Poplitea* or ham vein, is ſomewhat larger than ordinary. Fiftly, a little below the knee, it produces two other branches, lying upon each other in their paſſage out into the fore and hind skin of that place. You muſt note, that branch which runs into the skin of the hind part, is carried by a certain other ſprig, which it produces, into a branch of the *Poplitea* paſſing forth of the two twin muſcles. Sixtly, in the bigger part of the calf of the leg, it is divided into two other branches, which in like manner are diſtributed into the skin, as well in the foreſide as the backſide of the leg.

Where and in what diſeaſes, the *Sapheia* muſt be opened.

At length after many other diviſions, which for brevitie ſake I omit, when it arrives at the fore and inner ſide of the ankle (where it is commonly opened in the diſeaſes of the parts below the midriffe which require blood-letting) it is parted into two other branches, the leſſer of which deſcends to the heel; the other in many ſprigs is ſpent upon the skin of all the upper and lower part of the foot and toes.

To what places, and by ſhow manifold diviſions the internall branch of the crurall vein goes.

The ſecond branch of this crural vein, which we ſaid deſcends within together with the artery and nerve, even into the foot, is divided; firſt, piercing ſomewhat deep in, it produces four divarications; one internal deſcending below the original of the into *ſaphia* the muſcle called *Obturator externus*, and into certain other external muſcles. The three other run outwardly, the firſt towards the huckle-bone, by which the *Iſchias* is made, the two other into the fore muſcles of the thigh, neither are theſe ſprigs far remote from one another. Secondly,

Iſchiadica vena.

al that branch is divided into two other branches, the one above, the other below, an artery alwaies accompanying it; the lower of which is ſpent upon many of the hinder muſcles of the thigh ending nigh the ham. The upper, beſides, that it beſtows many branches upon the fore and inner muſcles of the thigh; deſcending to the ham, it produces the *Poplitea* or ham vein, made ſometimes of two branches, the one proceeding from above, and the other from below. This *Poplitea* deſcending by the bending of the ham, is ſpent one while upon the skin of the calf of the leg, another while upon the knee, otherwhiles encreaſed with branches of the *Sapheia*, it goes on the outſide of the ankle to the skin, on the upper ſide of the foot, and ſometimes on the lower.

Muſcula vena.

Poplitea vena.

Thirdly, a little below the original of the ham vein, and under the bending of the knee, it brings forth the *Suralis*, which is beſtowed upon the muſcle of the *Sura*, or calf of the leg, and upon the skin of the inner ſide thereof, and of the foot continued ſometimes even to the inner part of the great toe.

Suralis vena.

Fourthly, under the head of the hinder appendix of the bones of the leg, it produces between theſe two bones, another vein, which nouriſhing the fore muſcle of the leg, is conſumed upon the foot.

Fiftly and laſtly, it brings forth the *Iſchiadica major* or greater *Iſchias*, which is divided into two branches of an unequall bigneſſe; the larger whereof, from his originall deſcending alongſt the inner part of the leg bone, inſinuates it ſelf under the muſcles of the calf, between this and the heel, into the ſole of the foot, upon which it is waſted, divided into ten ſmall ſprigs, two for each toe; the other being the leſſer deſcending alongſt the *Perone*, or ſhin-bone, is conſumed between it and the heel, yet ſometimes it is produced, not only even to the muſcle the *Abductor* of the toes, but alſo by five ſurcles, even to the fourth toe, and the ſides of the middle toe.

Iſchiadica major.

CHAP.

CHAP. XXXII.

The Distribution of the Crurall Artery.

THe crurall artery arising from the same place whence the crurall vein proceeded, and descending with the internall crurall vein, is distributed as followeth.

First, into the muscle of the thigh, which spreading it self through the muscles thereof meets with the utmost *hypogastrica*, descending with the vein through the common hole of the huckle and share bone, and is joined with it. *Arteria muscula.*

Secondly, when it arrives at the ham, between the *Condyles* or processes of the leg, it sends two branches into the knee.

Thirdly, a little after it produces another branch, which it sends to the exterior muscles of the leg, and when it arrives at the middle of the leg, it is divided into two branches, between the twin muscles and *Soleus*, the one internall, the other externall; the internall, some surcles communicated by the way to the parts by which it passes, but specially to the joint of the ankle, stretches it self over the sole of the foot, between the lower extremity thereof and heel, whither when it arrives, it is divaricated into five surcles, of which it bestowes two on the great toe, two on the next, and one on the middle toe. The externall descending in like manner to the sole of the foot, between the *fibula* and the heel, besides other sprigs, which it may spread by the way, it produces one without on the joint of the ankle, another in the muscle, the *Abductor* of the toes, to the wrist and back of the foot. But the remainder is divided into five portions, of which two are sent to the fourth, and two to the little toe, and one to the middle.

CHAP. XXXIII.

Of the Nerves of the Loins, Holy-bone and Thigh.

THere arise five conjugations of nerves from the loins, divided into externall and internal branches; the external are disseminated into the *Rachita* or chin muscles, the muscles *Semispinatus* and *Sacer* and the skin lying over them. The internall are sent into the oblique ascendent and transverse muscle of the lower belly, into the *Peritoneum*, into the loin and chest muscles arising there, but after a different manner; for some are absolutely carried thither, as the nerves of the first conjugation of the loins, and oftentimes also of the second, but that sometimes they send a small sprig to the testicles, when the Costall have sent none thither; but some lower are partly distributed there, and partly sent some other way; for the greater portions first united amongst themselves, then presently with the portions of these of the holy-bone, goe into the thigh, as we shall shew in the distribution of the nerves of the holy-bone. The five conjugations of the nerves of the loins. Where the testicles have their nerves.

Now from the holy-bone, proceed six conjugations of nerves, reckoning that for the first which proceeds from the last *Vertebra* of the loins, and first of the holy-bone, and that the sixt which proceeds from the lowest part of the holy-bone, and the first of the rump; these conjugations of nerves are divided into externall and internall branches. The conjugation of the nerves proceeding through the holybone.

The lesser externall passing forth by the externall and hinder holes of the holy-bone, are distributed into the parts properly belonging thereto, to wit, the muscles and skin thereof; for every nerve by the law of nature first and alwaies yeelds to the neighbouring parts, that which is needfull, then presently to others as much as it can. An *Anatomicall* axiom.

Wherefore if thou wouldst know whence each part hath his vessels at the next hand, that is, the veins, arteries, and nerves, thou must remember the site of each part, and the course of the vessels, and to consider this, that the veins and arteries as speedily and conveniently as they can, insinuate themselves into the parts, sometimes at the head or beginning, somewhiles by the middle or extremes thereof, as there is occasion.

But a nerve principally enters a muscle at the head thereof, or at least not far from thence, but never by the tail, whereby it may easily be understood by what branch of each vein, artery, and nerve, each part may have nourishment, life, and sense. The other internall branches of the foresaid conjugations goe, especially the four uppermost united from their originall with the three lowermost of the loins, into all the leg, as you shall presently hear. But the two lower are consumed upon the muscles called *Levatores Ani*, the *Sphincter* muscle of the same place; besides, upon the muscles of the yard, and neck of the bladder in men, but in women upon the neck of the womb and bladder.

For these parts admit another in their bottom from the costall nerve, being of the sixth conjugation of the brain; these thus considered, let us come to the nerves of the thigh, which (as we said) from their first originall, as it were compacted and composed of the greater portion of the three inner and lower branches of the loins, and the four upper of the holybone, are divided in the thigh into four branches, of which the first and higher descending from above the *Peritoneum*, to the little *Trochanter*, is wasted upon the inward and superficiary muscles of the thigh, and the skin which covers them a little above the thigh.

The

The ſecond, deſcending with the crurall vein and artery by the groin, is divided into two branches like as the vein, the one internall, the other externall, of which the internall deſcending with the vein and arterie is ſent into the inner and deep muſcles of the thigh, ending above the knee. But the externall deſcending ſuperficially with the *Saphæa*, even into the foot, gives branches by the way to the skin which covers it.

The third ſeated under theſe former, paſſing by the hole common to the ſhare and hanch-bone, ſends certain branches to the groins, to the muſcles called *Obturatores*, to the *Tricipites*, and ſometimes to the muſcles of the yard, and it ends at the midſt of the thigh.

The fourth, which is the thickeſt, ſolideſt and hardeſt of al the nerves in the body, deſcending wholly from the productions of the holy-bone, and deſcending outwardly, between the lower part of the ſame bone, and the *Os Ilium*, or Hanch-bone to the thigh, beſtows certain ſprigs to the hind muſcles thereof proceeding from the protuberation of the *Iſchium* or huckle-bone, and in like ſort it gives otherſome to the skin of the buttocks, and alſo to the skin covering the forementioned muſcles.

A little after, it is parted into two branches deſcending undivided even to the bending of the knee, they both are communicated by divers ſurcles of the muſcles of the leg; yet ſo as the leſſer produces another branch from the reſt of the portion thereof deſcending on the fore part of the leg, alongſt the ſhin-bone unto the top of the foot, where it is divided into ten ſurcles ſcarce apparent to the ſight, two running to each of the toes. The other greater deſcending in like manner in the remainder of its portion by the hind part of the leg into the ſole of the foot, caſts it ſelf with the veins and arteries between the heel and leg bone, were firſt divided into two branches, each of which preſently parted into five, ſend two ſprigs to the ſides of the toes. And theſe are the moſt notable and neceſſary diſtributions of the veſſels and nerves; we purpoſely omit others which are infinite, and of which the knowledge is impertinent.

CHAP. XXXIV.

Of the proper parts of the Thigh.

HAving explained the common parts of the leg in generall; now we muſt come to the proper, beginning at the Thigh. The proper parts of the Thigh, are muſcles, bones, and ligaments. But becauſe the demonſtration of the muſcles is ſomewhat difficult, if we be ignorant of the deſcription of the bones from whence they ariſe, and into which they are inſerted; therefore we judg it worth our labour, firſt to ſhew the bones, and the dearticulation of theſe of the Thigh; beginning with theſe bones which are knit with the upper part of the holy-bone.

Of how many bones the *Oſſa Ilium* conſiſt.

And they are two in number, on each ſide one, commonly called the *Oſſa Ilium*; each of theſe is compoſed of three bones, of which one is the upper, another the lower and anterior, and the third the middle, and after a manner the poſterior. The upper by a particular name is

What the *Os Ilium* ſtrictly taken is.

called the *Os Ilium*, the hanch-bone, and it is the largeſt and biggeſt, having a griſtly Appendix in the compaſſe thereof, even to the connexion it hath with the other neighbouring bones, whoſe upper part we term the right line thereof; but the *baſis*, which is adjoined to it by *Symphyſis*, we call the lip or brow thereof, becauſe it ſtands both ſomewhat out and in, after the manner of the brow. But that which lies between the *baſis* and ſtreight

What the line, lip, brow and rib of the *Os Ilium* are.

line we name the Rib; this ſame upper bone hath two hollow ſuperficies, the one internall, the other externall. The connexion thereof by *Symphyſis*, is twofold, the one with the upper part of the holy-bone; the other with that bone we called the middle, and after ſome ſort the poſterior; which taking its beginning from the narrower part of the *Os Ilium*,

The *Os Iſchium*, or huckle-bone

makes that cavity in which the head of the thigh is received; this cavity the Greeks call *Cotyle*, the Latins *Acetabulum*, and it is ended by the ſide of the hole common to it, and the ſhare-bone; this middle, and in ſome ſort poſterior bone is called properly and particularly the *Os Iſchii*, or huckle-bone, and contains nothing elſe but the forementioned cavity, but that on the hind and lower part thereof, it brings forth a proceſſe, which adjoins it ſelf to the ſhare-bone at the lower part of the common hole, in which place it appears very rough and unequall, and it is called the tuberoſitie of the huckle-bone, at whoſe extremity alſo it brings forth a little head ſomewhat reſembling the proceſſe of the lower

The *Os pubis*, or ſhare-bone.

jaw called *Corone*. The third bone named *Os pubis* or the ſhare-bone, ſtretches it ſelf even to the higheſt part of the *pecten*, where meeting with the like bone of the other ſide, it is united to it by *Symphyſis*, after which manner alſo, all theſe three bones are united; it is reported, that this bone opens in women in their travel, yet hitherto I can find no certainty thereof.

You may perceive a manifeſt ſeparation of theſe three bones in the *Sceleton* of a child; for in thoſe who are of more years, the griſtles which run between theſe connexions turn into bones.

The deſcription of the thigh-bone.

Now followes the thigh-bone, the biggeſt of al the bones of the body; it is round, and ſo bended that it is gibbous on the exterior and forepart thereof, that ſo it might be the ſafer

from

from externall injuries; but on the hind and inner part, it is hollow or ſinous, like to the back of an Aſſe, whereby the muſcles might have a more commodious originall and inſertion.

The figure of the Thigh-bone.

A 1,2. The head of the thigh going into the cup of the hip-bone.
B, 2. A ſinus in the head of the thigh, into which is inſerted a round ligament.
C 1, 2. The conjunction of the appendix of the thigh with the bone it ſelf.
D 1, 2, 3. The neck of the thigh.
E F The two lower heads of the thigh.
G 1, 2. The conjunction of the lower appendix.
H 1, 12. A ſinus betwixt the two heads of the thigh.
K 2. A part of the lower head of the thigh, from whence the firſt muſcle of the foot doth proceed.
L 2. Another part from whence the ſecond and firſt muſcles ariſe.
M 2. Another part to which the Tendon of the fift muſcle of the thigh is infixed.
N 1, 2 A ſinus of the outward ſide of the head for the fourth muſcle of the leg.
O 2. A ſinus of the inſide through which the tendons doe paſſe.
P 2. A protuberation at which the ſaid tendons are reflected.
Q 2. The upper proceſſe of the thigh, and betwixt *Q* and *D* is the ſinus. *R* 1, 2. The union of the proceſſe with the thigh. *S S* 2. A rough line from the impreſſion of the externall proceſſes. *T* 1. The anterior impreſſion of the internall proceſſes, *θ*, betwixt *T* and *V* another impreſſion higher than the former. *V.* 1, 2. The fourth impreſſion in the top of the proceſſe. *X* 3. Four *X*, ſhew the four appendices of the thigh. *Y* 3. Three *Y*, ſhew the three heads of the thigh. *ZZ* 3. Two proceſſes of the thigh. *a* 1. The interior proceſſe of the thigh. *b* 1. The conjunction of the proceſſe with the thigh, *c c* 2. A line deſcending obliquely from the inner proceſſe. *d d* 2. A line running through the length of the thigh. *e* 2. The largeneſſe of the thigh in this part. *f* 1. A roughneſſe from which the eighth muſcle iſſueth. *g*, *h* 5. A knub of the Whirle-bone going into the ſinus marked with *I*, which is betwixt the heads of the thigh. *i* 5. A ſinus fitted for the inner head of the thigh. *k* 5. A ſinus agreeing with the externall head of the thigh. *l.* 5. the lower aſperity or roughneſſe. *m* 4. The foreſide of the pattell or whirle-bone rough and unequall.

That ſinous part a little below the midſt thereof, is divided into two lines, the one whereof goes to the internall tuberoſity, the other to the externall of the lower appendix of the ſame thigh. Theſe are chiefly to be obſerved, becauſe the oblique fibers of the vaſt muſcles thence take their originall.

Beſides, this bone hath two appendices in the ends thereof, as eaſily appears in a childs thigh; the upper appendix makes the round head of the thigh it ſelf, which (as every other appendix) ſeated upon a long neck, is received in the cavity of the hanch-bone by *Enarthroſis*; it is ſtayed and faſtned there by two ſorts of ligaments, of which the one is common, proceeding from the muſcles, which deſcend from above, about the neck thereof; the other is proper, which is twofold, that is, one membranous and broad, proceeding from the

The two appendices of the thigh-bone.

the whole cavity of the orb, or cup, deſcending about all the head of the thigh, above the neck thereof; the other thick and round, deſcending from the ſecond cavity of the *Cotyle* it ſelf, which is extended, even to the common hole at the top of the head thereof.

The two proceſſes of the thigh-bone make the two *Trochanters.*

Beſides, under this head, that bone hath two proceſſes, the one great and thick, the other little and ſhort.

The greater ſeated in the hind part, is called the great *Trochanter*; the leſſer ſituate in the inner part, is named the little *Trochanter.*

But you muſt note, that the greater *Trochanter*, on the higher and hind part thereof, which looks towards the head of this bone, makes a certain ſmall *ſinus* or boſome, into which the twin muſcles and others, whereof we ſhal hereafter ſpeak, are implanted; we muſt alſo conſider the multitude of holes encompaſſing this neck, between the head and the two *Trochanters*, which yeeld a paſſage to the veſſels, that is, the veins, arteries, and nerves, into the marrow of the bone it ſelf, whence the marrow it ſelf becomes partaker of ſenſe, eſpecially on that part which is covered with a coat, and the bone lives and is nouriſhed.

Whence the marrow becomes partaker of ſenſe.

The other Appendix of the thigh, that is, the lower, is the greateſt and thickeſt, riſing as it were with two heads, which are divided by two cavities, the one ſuperficiary and on the foreſide, whereby it receives the whirl-bone of the knee; the other deep, and on the back part, by which it receives the griſtly and as it were bony ligaments, proceeding from the eminencie which is ſeen between the two cavities of the upper appendix of the bone of the leg, which *Hippocrates, lib. de fracturis*, calls in his tongue *Diaphyſis.*

CHAP. XXXV.

Of the Muſcles moving the thigh.

Their number.

THe muſcles of the thigh are juſt fourteen in number, that is, two bend it, whereupon they are called the *Flexores*, or benders; three extend it, whereupon they are called *Tenſores*, extenders; three move it inwards, driving the knee outwards, and drawing the heel inwards, as when we croſſe our legs; yet ſome make theſe three one, and call it the *Triceps*, or threeheaded muſcle. Six ſpread it abroad, and dilate it, as happens in the act of venery.

Four of theſe are called *Gemini* or Twins, by reaſon of the ſimilitude of their thickneſſe, originall inſertion and action; the two other are called *Obturatores*, becauſe they ſtop the hole which is common to the ſhare and back-bones.

The two *flexores.*

Now one of the two *Flexores*, being round, deſcends on the inſide with fibers of an unequall length from all the tranſverſe proceſſes of the loins, above the hind commiſſure of the hanch and ſhare-bones, and is inſerted into the little *Trochanter*; the other broader and larger from the origiuall paſſes forth of the whole lip, and inner brow of the hanch-bone, and filling the inner cavity thereof, is inſerted above the forepart of the head of the thigh, into the little *Trochanter* by a thick tendon, which it with the fellow muſcle lately deſcribed, produces even from the fleſhy part thereof, wherefore you need to take no great pains in drawing or plucking them away.

The three *tenſores*,

The three *Tenſores* or extenders, make the buttocks, of which the firſt being the thicker, larger, and externall, ariſing from the rump, the holy-bone, and more than half of the exteriour and hinder lip of the hanch-bone, is inſerted by obliqne fibers, ſome four fingers bredth from the great *Trochanter* at the right line, which we ſaid, reſembled an Aſſes back.

The ſecond, which is the middle in bigneſſe and ſite, deſcends from the reſt of the lip, and from the fore and outward rib of the hanch-bone, and above the midſt of the bone, is inſerted into the upper part of the great *Trochanter*, by a triangular inſertion above the upper and exterior part thereof.

The third being leſſer, ſhorter, and thinner, lying hid under theſe former, proceeds from the middle of the externall ſurface of the hanch-bone, and then is inſerted into the greater part of the right line of the great *Trochanter.*

Theſe three muſcles have a great and large originall, but a narrow inſertion, as it were by oblique fibers.

Three *Intromittentes.*

Then follow thoſe three muſcles which move the thighs inwards, ſtraiten and croſſe them, ſo that the knee ſtands forwards or outwards, but the heel is drawn inwards, as you may underſtand by their inſertion, although ſome think otherwiſe. But theſe three muſcles by their originall, partly fleſhy, and partly membranous, ariſe from the upper and forepart of the circumference of the ſhare-bone, and thence are inſerted into the hind line of the huckle-bone, ſome higher than otherſome; for the leſſer and ſhorter ſtayes at the roots of the little *Trochanter*, the middle deſcends a little deeper, the third with the longeſt of his fibers, deſcends even to the midſt of the line.

This if it be ſo, that is, theſe muſcles proceeding from the fore and upper part, to be inſerted into the hinder line of the huckle-bone, whilſt they alone perform their action, and draw the thighs together, they will turn them outwards, juſt ſo as when we put them acroſſe,

acroſſe, but they will not draw one heel to another,and put the heel outwards, for ſuch like motion is performed by the inner vaſt muſcle of the thigh, moving the leg. Now follow the ſix which move the buttocks.

The movers of the buttocks.

The firſt, and higher of the *Quadrageminii*, or the four twin muſcles, paſſes forth of the commiſſure of the holy-bone,with the bone of the rump,or rather from the loweſt extream of the holy-bone,and thence it is inſerted into the cavity of the great *Trochanter* by a tendon of a ſufficient largeneſſe.

The ſecond proceeding from the hollow part or fiſſure, which is between the extremity of the huckle-bone,and the tuberoſity or ſwelling out of the ſame, is inſerted in like manner into the cavity of the great *Trochanter*.

The third aſcends from the inner part of the ſwelling out of the huckle-bone, a little above, between the two *Trochanters*, into the cavity of the greater of them.

The fourth and laſt, the loweſt and broadeſt of them all,proceeds from all the exteriour protuberancie of the huckle-bone,and thence is inſerted into the great *Trochanter*,and theſe four muſcles lie hid under the thick and more eminent part of the buttocks;wherefore that you may the better ſhew them, they muſt be turned up towards their originall.

The two *Obturatores*.

The two *Obturatores* remain to be ſpoken of,that is, the internall and externall, both which ariſe from the circuit and circumference of the hole which they ſtop, which as we ſaid is common to the ſhare and huckle bone,but the internall aſcends to the exterior root of the great *Trochanter* by the middle fiſſure between the upper part of the protuberancy of the huckle bone, and the ſpine which ſtands up in the hinder baſis of the hanch bone.

But the externall proceeds from the exteriour cavity,and the middle ſpace between the tuberoſity of the huckle bone and cavity thereof,and is inſerted into the lower part into the cavity of the great *Trochanter*, together with the *Quadrageminii*.

If you would plainly ſee the exteriour *Obturator*, you muſt either cut off the beginning of the three-headed muſcle, or handſomely pluck it away, and then extend it, and turn it up; the internall is eaſily diſcerned when the bladder is taken away.

CHAP. XXXVI.

Of the bones of the Leg, or Shank.

What the *Patella*, or whirle bone of the knee is.

THoſe which would deſcribe the muſcles of the legge, ought firſt to deſcribe the bones thereof,beginning at the *Rotula*, or whirle bone of the knee.

This bone is griſtly on the outſide,and round in compaſſe, but on the inner and middle part after ſome ſort gibbous,but ſomewhat flatted at the ſides,that ſo it may be fitlier applied to the joint of the knee,and fitted within the anteriour cavity of the two appendices of the thigh,and the upper and foremoſt of the leg.

The uſe thereof

The uſe thereof is to ſtrengthen the joint of the knee, and to hold the leg at his due extent,ſo that it may not be bended ſo far forwards,ac it is backwards.

What, and how many bones the leg hath.

The bones of the leg are two,the one thicker, called by the particular and proper name, the *Os Tibie* or leg bone;the other which is leſſer,is termed *Perone*, or *Fibula*,but commonly the leſſer *ſocile*,(and in Engliſh it may be termed the ſhin-bone.) The thicker being hollow and marrowie, is ſeated in the inner part of the leg,having two proceſſes, the one bigger, the other leſſe.

The leg-bones

The bigger ſeated on the upper part of the bone,and conjoined to it by *Symphyſis*,makes two ſuperficiall and ſide cavities disjoined by an indifferent riſing;wherefore this bone is connext to the bone of the thigh by *Ginglymos*. For in the cavities thereof it receives the lower and hinder protuberances of the Appendix of the thigh bone, but the middle eminencie thereof, is received by it between the two protuberances thereof.

This joint is ſtrengthned,not only by the force of the tendons, or muſcles ending there, but alſo of three ſtrong ligaments, of which one proceeds from all the externall, another from all the internal parts of thar connexion;the third which we,out of *Hippocrates*,called *Diaphyſis*,from the diſtance or ſpace between them. The other proceſſe of the leg bone, which we called the leſſe, ſeated in the lower part thereof,makes as it were a double cavity, whereby it receives the *Aſtragalus* or paſtern bone;but on the inſide it makes the ankle, as the *Perone* makes it without: between theſe ankles the *Aſtragalus* is received on the ſides,and turned as the nut in a Croſſe-bow,as often as there is need to bend or extend the Foot. Beſides, this ſame leg-bone, being triangular,hath three eminencies made in the ſhape of an Aſſes back;the ſharper deſcends alongſt the fore part, called by the Greeks *Antionemion*; the ſecond reſides on the inner part,and the third on the outer;all theſe muſt be diligently obſerved, and chiefly, that on the forepart;becauſe it is as a guide and rule to a Chirurgeon in the well ſetting of a broken leg. The Perone, or ſhin bone, is ſeated, as it were, on the outſide, and as behind the leg-bone; it hath alſo two appendices hollow on the inſide, but gibbous on the out.This bone by the upper of theſe is faſtned and inſerted under the inner,and in ſome ſort the hinder appendix of the leg bone,ſo that it is in no ſort articulated with the thigh,but ſerves only in ſtead of a leaning ſtock.But by the lower, this ſame bone is not only received in the loweſt part of the leg,or ankle, or paſtern bone, but

What *Diaphyſis* is.

The *Perone fibula*, or ſhin-bone.

alſo receives part thereof, which is joined on the ſame ſide with the heel, eſpecially then when we bend our foot outwards.

This bone is faſtned to the forementioned bones by *Synarthroſis*, but bound by ſtrong ligaments proceeding from the ſame bones, and mutually ſent from one to another, or if you had rather, from the upper into the lower, as we ſaid in the arm. But this ſame *fibula* or ſhin bone is alſo triangular, having three lines, of which one ſtands outwards, another on the foreſide, and the third behind.

CHAP. XXXVII.

Of the Muſcles of the Legs.

Their number. ALL the motions of the leg, are performed by eleven muſcles, of which there be ſix on the foreſide, and five on the hind. But of theſe, ſome move the leg only, as thoſe which take their originall from the bone of the thigh; others truly move the leg, but with the thigh, as thoſe which ariſe above the thigh, that is, from the hanch, huckle, and ſhare bones.

The *Longus*. The firſt of theſe on the foreſide called the Long, but commonly the *Sutorius* (or Tailor muſcle, by reaſon of its action) it ariſes from the lower and fore extremity of the ſpine or appendix of the hanch bone, and deſcending obliquely above the other muſcles, is inſerted by a large and membranous tendon, in the fore and inner part of the leg under the knee; the action thereof is to croſſe the legs, but being firſt bended by the muſcles preſently to be treated of, it helps alſo the three headed muſcle in the performance of the formentioned action.

The *Membranoſus*. The ſecond of theſe four muſcles is termed the *membranoſus*, or membranous, becauſe it is wholly ſuch, unleſſe at the originall where it deſcends fleſhy from the root and baſis of the above mentioned ſpine of the hanch bone, and that obliquely with its membranous and broad tendon (mixed with the common coat of the muſcles) into the outward part of the leg, which it moves outwards, as alſo the thigh with the four twin muſcles; for as we have in another place obſerved, of two oblique motions concurring in one, is made a right motion; and beſides, almoſt all the motions of the body, are thus performed; the muſcles which perform ſuch motions are placed and oppoſed in an oblique ſite, as may be perceived by the motions and ſite of the muſcles of the hand taken in generall.

The *Rectus*. The third, called the *Rectus*, or right (becauſe it deſcends above the *Crureus*, alongſt the right fore line of the thigh, between the two vaſt muſcles) comes forth between the extremity of the appendix of the hanch bone and cavity thereof, with a very ſtrong ligament, and then is inſerted into the forepart of the leg, paſſing over the midſt of the whirle-bone of the knee; it extends the leg, with the three following, but by accident it may help the bending of the thigh.

The two *Vaſti*. The fourth and fifth are called *Vaſti*, vaſt or huge muſcles, by reaſon of their largeneſſe, the one of theſe is internall, the other externall: they both ariſe with right fibers, from their originall, but with oblique at their inſertion, by reaſon whereof they both ſeem to have a compound action from a right and oblique motion; the right helping for the extenſion of the leg, but the oblique to draw one knee to another, or to disjoin both the knees; the internall comes by its right fibers from the root of the little *Trochanter*, but by its oblique from the inner deſcendent line of the thigh. The externall paſſes forth by its right fibers from the root of the great *Trochanter*, but by the oblique from the externall deſcendent line of the ſame bone. But all theſe fibers are in certain places ſo mixed with the *Crureus* that they cannot be ſeparated unleſſe you violate the one of them; they go into the leg (each on his ſide) above the whirlbone of the knee alongſt the ſides of the right muſcle, with which it makes an unſeparable tendon, as you ſhall preſently hear. The fixt and laſt of theſe fore muſcles called the *Crureus*, or thigh muſcle (by reaſon of the ſtrait and firm adheſion, which it hath with the thigh bone, which is by ſome called *Crus*) from the ſpace between the two *Trochanters* deſcends under the right muſcle and two vaſt muſcles into the forepart of the thigh, even to the whirlbone of the knee. But we muſt note that theſe four laſt muſcles make a common thick and broad tendon, with which they cover the *Patella*, or whirl bone, and all the fore dearticulation of the knee, that they cannot be ſeparated without tearing; wherefore we muſt think that this tendon ſerves the knee for a ligament; now all theſe muſcles performing their action together, extend the leg. The five hind muſcles follow to be ſpoken of; of which three ariſe from the tuberoſitie of the huckle bone, going into the inner part; the fourth from the middle of the *Pubis*, called *Biceps*, that is, the two-headed muſcle into the outſide of the leg.

The *Crureus*.

The three Internall. Of the internall, one paſſing from the forementioned tuberoſity, deſcends ligamentous even into the midſt of the thigh, and then becoming fleſhy, is inſerted by its tendon, after the manner we formerly mentioned.

The other being ſlender, paſſing forth alſo from the ſame place, with its tendon, is inſerted with the tendon of the long muſcle, and ends in the inner part of the leg, which with its companion, it draws inwardly, and brings to the other, which ſame thing it performs in the thigh, by the help of the three-headed muſcle.

The

The third being the inner, or hinder, descends from the middle part of the share-bone, with a broad and slender ligament, and is inserted with a round tendon, into the inner part of the leg after the manner of the forementioned.

The fourth called *Biceps* takes one of the two heads, of which it consists, from the last mentioned tuberositie, the other from the outer line of the thigh, but is inserted into the externall part of the leg, as we formerly said. — The *Biceps*, or two-headed muscle.

The fifth and last called the *Popliteus* descends obliquely fleshy from the externall condyle or knot of the thigh, into the inner and hinder part of the leg, at the joining thereof to the shin-bone; the action thereof is, to draw the leg, after a manner inwards. — The *Popliteus*, or ham muscle.

CHAP. XXXVIII.

Of the Bones of the Foot.

THe Order of Anatomy requires, that we now prosecute the muscles moving the foot; but because we should in vain deliver their insertion, the disposition and condition of the bones of the foot, not being first known, wherefore it first behoves us, to set forth their description. Therefore the bones of the foot are six and twenty in number, distinguished into three ranks; that is, the bones of the *Tarsus* or Instep, are seven; those of the *Pedium*, the afterwrist, or Back of the foot, five; and those of the toes, fourteen. Of the seven bones of the instep, there are 4 named, and 3 unnamed. The first of the named immediately following the bones of the leg, is called *Astragalus*, the pastern or ankle-bone. This hath three connexions, one, as we said before, in the upper and broader part, with the bones of the leg, of which it is received; the other in the lower and hind part, by which it receives the upper and inner processe of the bone of the heel; the third on the foreside by which it is received in the cavity of the *Os Naviculare* or *Scaphoides*, that is, the boat-like bone. By the first connexion the foot is extended and bended; by the second it is moved with the heel to the sides: the two first connexions are by *Diarthrosis*, the last by *Synarthrosis*. But it is strengthned by strong and broad ligaments, descending and ascending from one bone into another; also they are strengthned by membranes, muscles and tendons, descending to the foot, above and under these joints. But this bone hath three processes, as three feet fastened to the bone of the heel; of which the first and least is under the outer ankle; the bigger (which *Galen* saith, makes a round head, fastned on a long neck) looks towards the forepart of the foot, over against the great toe, and the next toe to it; the middlemost is at the heel, behind the leg-bone. — Their number. The bones of the Instep. — The *Astragalus* its three connexions and their use. — Its three processes.

I passe over in silence many other things; as the smoothness and asperity or roughness of the bone, which I had rather you should learn by ocular inspection, than by book. The second bone lying under this is called the *Calcaneum*, or heel-bone, being the biggest of all the bones of the foot, upon which all the body relies when we go. It hath two upper processes, the one great, the other little. The great is received in the hind and outer processe of the *Astragalus*; the lesser is received on the inside in the third processe of the same bone, which we said had a round head fastned to a long neck. Besides, it is round on the hind part, and much disjoined from the leg-bone, but on the fore and longer part, it is knit by *Synarthrosis* to the Die-bone, whose lower and inner part, it seems to receive; the superficies thereof is wholly unequall, and rising up with many swellings. On the inner side it makes as it were a channell, so to give way, as well to the vessels as tendons going to the sole of the foot and toes. Lastly, we must consider the holes by which the vessels passe into that bone to give it nourishment; by reason of which vessels the fracture of this heelbone, is very dangerous, because of the pressing and contusion of the vessels; as *Hippocrates* shews. For the ligaments of this heel, or heel-bone, they are such, as these of the *Astragalus*, to wit, tendons, membranes and ligaments properly so called, coming from one bone to another. The third bone of the foot is named *Scaphoides* or boat-like, from the resemblance it hath to a boat, for on that part which looks towards the pastern bone, it is hollow; but on that part which is next the three *Innominata*, or nameless bones (which it sustains, and of which it is received, as it in the cavity thereof receives the head of the *Astragalus*) it is gibbous like the bottome of a boat. The connexions thereof are by *Synarthrosis*, and they are strengthned by the forementioned ligaments; this same bone is arched on the upper part, but somewhat hollowed or flatted below; the inner part ends in a point, like the prow of a ship, but the outer obtuse like the stern of a ship. The fourth bone of these which have names, is called the *Cuboides*, from the resemblance of a Die; although that similitude be very obscure. On the forepart it sustains the toes, which by a certain proportion to the fingers of the hand, may be called the ring and little toes; but it is sustained on the hind part, with the back part of the heel; on the inner side it is joined with the boat-like bone, and that nameless bone which sustains the middle toe; on the outside, it produces a rising like the back of an Asse, which on the lower part is extended transversely all the length thereof; at the two sides of this eminency or rising, there are two smal cavities, in form of a channel. — The description of the *Calcaneum* or *Calx*. — Why a fracture of the heel is so dangerous. *Hippocrates*, *Sect. 3. lib. de fracturis.* — The *Os Scaphoides*, or boat-like-bone. — The *Os Cuboides* or Die-bone.

The Figure of the bones of the Foot properly ſo called.
Figure 1, and 2. ſhew the bones of the right foot faſtned together their upper face and their neather face.
Fig. 3, 4, 5, and 6. ſhew the upper, lower, inner and outer ſides of the Talus or paſtern.
Fig. 7, 8, 9. ſheweth the ſame ſides of the Heel.
Fig. 10, and 11. ſheweth the forward and backward ſide of the boat-bone.
Fig. 12, 13. ſhew the fore and back part of the wriſt made of four bones.

ABCD 3,5,6. The protuberation of the *Talus* joined to the appendix of the leg-bone, and of this protuberation four ſides.
EE 3. A *ſinus* inſculped in the protuberation of the *Talus*.
FF 3, two bunching parts of the *Talus*.
G 3, the inner ſide of the protuberation of the *Talus* cruſted over with a griſtle, joined to the inner ankle.
H 6, the outward *ſinus* of the potuberation of the *Talus* covered over with a griſtle, and receiving the inner ankle.
I 5. A rough *ſinus* of the *Talus*, receiving a griſtly ligament from the inner ankle.
K 6, a *ſinus* of the *Talus* receiving a griſtly ligament from the outward ankle.
L M 5, 6, two *ſinus* in the hinder part of the *Talus*.
N 3, 4, 5, 6. the neck of the *Talus* or paſtern bone.
O 3, 4, 5, 6. the head of the *Talus* going under the *ſinus* of the boat-bone.
P 7, 8, 9. the head of the heel cruſted over with a griſtle, and going under the *ſinus* of the *Talus* or the paſtern bone.
Q 4. a large *ſinus* of the *Talus* receiving the head of the heel. R 7, 8, 9. a *ſinus* of the heel wherto the lower part of the head of the *Talus* is joined. S 4. the lower power of the head of the *Talus* going into the *ſinus* of the heel. TT 4. a ſharp *ſinus* of the heel receiving a griſtly ligament from the paſtern bone. X Y Z 2. the place of the heel. YZ 2. Y 8. Z 9. a proceſſe of the heel made for the production of muſcles. *a b* 7, 8, 9. from *a* to *b* the diſtance of the upper part of the heel. *c* 8, 9. the hinder part of the heel. *d* 2, 3. the inner ſide of the heel. *e* 8. the place where the tendons that run to the bottom of the foot are reflected. *f* 7, 8. the utter ſide of the heel. *g* 1, 7, 9. here the tendons of the 7 and 8 muſcles of the foot are ſtretched out. *h* 7. the forepart of the heel which is joined to the paſtern bone. *i* 7. that part of the heel which is joined to the Cube bone. *k* 11. the *ſinus* of the boat bone receiving the head of the *Talus*. *l m n* 10. three ſurfaces of the boat bone lightly prominent, which are articulated to the bones of the wriſt. *o p* 11. the upper part of the boat bone regarding the top of the foot. *q r* 10. and *q* 11. his lower part. *q* 10, 11. A *ſinus* through which the ſixt muſcle of the foot is led. *ſ t u* 13. the plain ſurfaces of the three inner bones of the wriſt whereby they are articulated to the boat bone. *x* 13. a ſhallow *ſinus* of the Cube bone whereby it is articula ted to the heel. *αβ* 12. the place of the Cube bone to which that bone of the Afterwriſt is joined which ſupporteth the laſt toe ſave one. *γ* 12, 13. the place of the Cube bone where the third bone of the wriſt is articulated. *δ* 12, 13. that part of the Cube bone which reſpecteth the outſide of the foot. *ε* 12, 13. the ſurface of the Cube bone in the upper part of the foot. *ζ* 2, 13. that part of the Cube bone which regardeth the earth. * 2, a *ſinus* of the

Cube

Cubebone at which the tendon of the ſeventh muſcle of the foot is reflected. B 13. a proceſſe of the third bone of the wriſt whereinto the fifth muſcle of the foot is inſerted. ι 12. the place of the inner bone of the wriſt to which that bone of the Afterwriſt which ſuſtaineth the great toe is coupled. ϰ 12. the place of the ſecond bone of the wriſt whereto the bone of the Afterwriſt that ſupporteth the fore Toe is articulated. λ 12. the place of the third bone of the wriſt whereto that bone of the Afterwriſt which ſupporteth the middle Toe is articulated. μ 1, 2. a ſmall bone whereby that bone of the Afterwriſt which ſuſtaineth the little toe is joined unto the Cubebone. ν 1, 2 the diſtances betwixt the bones of the Afterwriſt. ξ ξ, 1, 2. the heads of the bones of the Afterwriſt, which enter into the boſomes of the toes. ο 2, a proceſſe of the bone of the afterwriſt wherein the tendon of the ſeventh muſcle of the foot is implanted. π 2, a proceſſe of the bone of the Afterwriſt, which ſuſtaineth the little toe, which proceſſe receiveth the tendon of the eight muſcle of the foot. ρ, ς, τ, 1, 2. the three bones of the foretoe. υ, φ, 2, two ſeed bones placed under that bone of the afterwriſt which ſuſtaineth the great toe. * 2 under *X*. a ſeed bone ſet to the ſecond joint of the great Toe. Γ, 1, 2. the *Talus* or paſtern. Δ, 1, 2. the Heel. Θ, 1, 2, the Boat-bone. Λ, Ξ, 1, 2. the bones of the toes. Φ, X, 1, 2. two bones of the great toe, I, II, III, IV, V, 1. the five bones of the afterwriſt.

The firſt and the greater of the *Oſſa innominata*, or nameles bones, ſuſtains the great toe; the leſſer and ſecond, the next toe thereto; the third and middle in bigneſſe, the middle toe. Theſe three bones are arched on their upper part, but ſomewhat hollowed below. They are knit to the three forementioned bones by *Synarthroſis*, of which they are received, but on the hind part with the boat-like bone which they receive. Now we muſt come to the bones of the ſecond rank, that is, of the *Pedium*, or back of the foot; theſe are five in number, bearing up the five bones of the toes. They are ſomewhat gibbous on the upper part, but hollow below; each of them hath two proceſſes at the end thereof, by the lower and firſt of which they receive the three nameleſs and Die-bone, but by the upper made into a round head, they are received of the firſt bones of the toes. Their connexions, whether with the toes, or bones of the inſtep, are by *Synarthroſis*. The ligaments as well proper as common are ſuch, as we ſaid of the former. The bones of the third order now remain to be ſpoken of which we ſaid, make the toes, and they are fourteen, two of the great toe, but three of each of the other toes. The firſt is ſomewhat longiſh, but the reſt are very ſhort, except that of the great toe, all of them on the upper ſide are round and convex, but on the lower ſomewhat hollow, and plain long-wiſe, that the tendons which bend them, may paſſe more ſtraitly and ſafely without inclining to either ſide, even to their furtheſt joints; although ſuch paſſages are much helped by the membranous & common ligament, which riſing from the ſides of theſe bones, involves theſe tendons, as we mentioned in the fingers. To conclude, each of theſe bones, the laſt excepted, have a double connexion by *Diarthroſis*, they are all unequall in their bigneſſe, that is, thick at their beginning (where they receive the heads of the precedent bones, upon which they move as a dore upon the hinges) and ſo they grow ſmaller towards the ends, but by their ends, they are received of the following bones: at their ends they riſe into two eminencies on their ſides, diſtinguiſhed by a cavity between them, through which occaſion they are far thicker at their ends, than in their middle. The Ligaments by which their connexions are faſtned, are ſuch as the former. The *Oſſa ſeſamoidea* or ſeed bones of the feet are like in number and ſite to theſe of the hands. But this is to be noted, that thoſe ſeed-bones which are in the firſt articulation are ſomewhat bigger than the reſt, and they are round and longiſh on the outſide, but ſmooth and hollow on the inſide, ſeated between two cavities, encompaſſed by three riſings, of which two are on the ſides, and the third in the midſt of the extremity of the firſt bone of the *Pedium*, which chiefly bears up the great toe. To conclude, before we come to ſpeak of the muſcles, we muſt obſerve that the foot was made for two commodities. The firſt is to ſtay and bear the whole body, when we ſtand, for which cauſe nature ſet not the great toe contrary to the other, as it placed the thumb on the hand. The other is for apprehenſion, or taking hold of, wherefore nature framed and made the foot, and theſe moveable and jointed in the toes, as in the fingers of the hand. Beſides alſo for that we muſt goe upon our feet, Nature hath made them in ſome places hollow on the lower ſide, and in otherſom plain in a triangular figure, that ſo our feet may carry us over every ſoil, plain, mountainous, equal and unequal, through all parts of the world.

The *Oſſa innominata* or nameleſs bones.

The bones of the foot or *Pedium*.

The bones of the toes.

The ſeed bones of the foot.

The twofold uſe of the feet.

CHAP. XXXIX.

Of the Muſcles moving the foot.

THe muſcles of the Leg moving the foot are abſolutely nine, three in the forepart and ſix in the hind. Two of the three fore muſcles bend the foot, when they jointly perform their action, but when ſeverally, each draws it to his ſide; the third chiefly extends the Toes, for other whiles it ſeems by its ſlenderer and longer tendon (which exceeds not that bone of the *Pedium* which ſuſtains the little toe) to help alſo to bend the foot.

Their number.

Muſculus Peronæus.

The firſt is called *Peronæus*, becauſe it deſcends alongſt the bone *Perone*; the other the *Tibiæus anticus*, for that it deſcends along the *Os Tibiæ*, or bone of the leg. The third from its action is called the *Digitumtenſor*, or Toe-ſtretcher. For their originall the *Peronæus* which ſeems to have two heads, deſcends from the upper appendix of the *Perone* or ſhin-bone by its firſt head, but by the other from the middle of the ſame bone from the fore ſide into the hind, as the ſuperficies ſhews which paſſes between the fore and outward line of the ſaid bone; but after it arrives at the lower and hinder appendix of the ſame bone, behind the outer ankle it produces two tendons, which by the guidance of the Ligaments as well proper, as common, goe, the thicker under the ſole of the foot, ending in the Die-bone and that bone of the *Pedium* which ſuſtains the great toe; the leſſer goes on the outſide to the Die-bone, and the laſt and leaſt bone of the *Pedium* which bears up the little toe, ſometimes a ſlender portion thereof is produced even to the ſide of the little Toe, extending it and drawing it from the reſt.

Tibiæus anticus.

The *Tibiæus anticus* or fore leg muſcle proceeding from the upper and outer appendix of the Leg-bone deſcends above the ſurface of the ſame bone, which is between the fore and outer line to which it adheres, as alſo to that ſurface even to the midſt, from which place it produces one tendon, which deſcending on the fore and loweſt part, ends on the outſide into two of the nameleſs bones, that is, into the firſt which is the thicker, and into the middlemoſt, but beſides by a ſlender portion thereof it is extended into the firſt and greater bone of the *Pedium*, ſo to extend the great toe, drawing it inwards to the other foot. And this muſcle with the precedent bends the foot, if they both perform their parts at once; but if ſeverally, each draws the foot towards his ſide. The third which is the *Digitumtenſor*, or Toe-ſtretcher, is twofold; the one takes its originall from the top of the leg, and running alongſt the ſhin-bone, and paſſing under the ring, carries it ſelf into the foot, in which it ends by five tendons going to all the joints of the Toes, and by a ſixth at that bone of the *Pedium* which ſuſtains the little toe, whereby (as we formerly ſaid) it helps the bending of the foot.

The Toe-ſtretcher is twofold.

The other deſcends into the midſt of the ſhin-bone, and ſomewhat faſtned thereto, by one tendon paſſing under the ring it goes to the great Toe. But you muſt note that all theſe Tendons have nervous, ligamentous and fleſhy fibers ſo ſeparated from each other, that they can equally alone perform their function, as if they were more diſtinct muſcles. And we muſt think the ſame of the reſt which have diſtinct tendons preſently from their fleſhy part.

The 6 hind muſcles.

The ſix hind muſcles follow, of which the two firſt are called the *Gemelli* or twins by reaſon of the ſimilitude of their thickneſſe, originall, inſertion and action. The third is called the *Plantaris*, becauſe it is ſpent upon the ſole of the foot, as the *Palmaris* upon the palm of the hand. The fourth is termed the *Soleus* or ſole muſcle by reaſon of the reſemblance it hath to the fiſh of that name. The fift the *Tibiæus poſticus* or hind leg muſcle which deſcends alongſt the back part of the leg-bone. The ſixth and laſt the *Digitumflexor* or Toe-bender, equivalent to the deep muſcle of the hand; ſome make but one muſcle of this and the *Tibiæus poſticus*, which produces three tendons; others had rather make three, as thus, that one ſhould be the *Tibiæus*, the other the bender of four Toes, the third the bender of the great Toe.

The two *Gemelli* or twin muſcles.

Now for the two *Gemelli* or twins, the one is internall, the other externall; the internall paſſes forth from the root of the inner Condyle of the thigh; but the externall from the externa l Condyle; and from this their original preſently becoming fleſhy, eſpecially on the outſide, they meet together a little after in their fleſhy parts, and with the *ſoleus* they make the thick and great tendon at the midſt of the leg, which from thence is inſerted into the back part of the heel; in this very tendon breed painfull kibes. The action thereof is, to help our going by putting forth the foot, whilſt it draws the heel towards its originall.

In what place the kibes breed

The *Plantaris* the leaſt and ſlendereſt of them all, paſſes forth fleſhy from the outward head of the leg-bone, and from thence the ſpace of ſome four fingers bredth it ends in a ſtrong and ſlender tendon, which it ſends between the twin and ſole muſcles to the ſole of the foot, there to produce a membrane which covers the ſole of the foot, and a muſcle equivalent to the upper bender of the Hand.

The *Plantaris.*

The *Soleus*, or ſole muſcle, the thickeſt of them all, and ſeated under the twin muſcles, deſcends from the commiſſure of the leg and ſhin-bones, and about the midſt of the leg, after it hath mixed his tendon with that of the twin muſcles, it runs into the foreſaid place that it may extend the foot for the foreſaid uſe.

The *Soleus.*

The *Tibiæus poſticus* deſcends from the hinder appendix of the leg and ſhin-bones, and adhering to them almoſt as far as they goe, by a ſtrong tendon, being as it were bony at the end thereof, it is inſerted into the Boat-like bone, and the two firſt nameleſs bones, ſo to help the oblique extenſion of the foot.

The *Tibiæus poſticus.*

The *Digitumflexor* twofold.

The laſt being the *Digitumflexor* or Toe-bender is twofold, for one ariſes from the leg-bone, in that place where the *Popliteus* ends, and inſerted into that ſame bone it goes even to the backſide of the inner ankle & from thence into the joints of four of the toes. The other draws his original from almoſt the middle of the ſhin-bone, and ſomewhat inſerted into it, it goes by the heel and paſtern bone to the great toe, mixed with the precedent; their action is to bend the firſt joint of the Toes, rather by the force of the common ligament, than by the ſmall portion of the tendon which ends there. But it is their action to bend the laſt dear ticulation of the Toes by their proper inſertion.

CHAP.

CHAP. XL.

Of the muſcles moving the Toes of the feet.

NOw follow the muſcles moving the Toes; theſe are eight in number, one on the upper, and ſeven on the lower ſide. The firſt proceeds from the Paſtern, heel and Die bones below the external ankle, or the ligament of theſe bones with the leg-bone, and obliquely ſtretched to the top of the foot is parted into five ſmall tendons to the ſides of the five toes, ſo to draw them outwards towards its originall, whereupon it is called the *Abductor* of the Toes, and alſo *Pedioſus*, becauſe it is ſtretched over the *Pedium* or back of the foot. Their number. The *Abductor* of the toes, or *Pedioſus*.

The firſt of the ſeven of the lower ſide called the *flexor ſuperior* or upper bender, ariſes from the heel and ſtretched alongſt the foot under the ſtrong membrane, (which from the heel is ſtraitly faſtned to the extremity of the bones of the *Pedium* to ſtrengthen the parts contained under it) is inſerted by four tendons, at the ſecond joints of the four toes which it bends. Here you muſt note, that neer the inſertion thereof, this muſcle divides it ſelf, like that muſcle of the hand which is called *ſublimis*, that ſo it may give way to the deep, which (as we ſaid) deſcends alongſt the fingers, to which a certain common membranous ligament adjoins it ſelfe, which involves and faſtens it to the bone all alongſt the lower part of the fingers, even to the laſt dearticulation. The *Flexor ſuperior*.

The ſecond equivalent to that muſcle of the hand which is called *Thenar*, ſeated on the inner ſide of the foot, ariſes from the inner and hollow part of the heel and paſtern bones, and ends in the ſide, and inner part of the great toe, which it draws from the reſt, inwards. This may be divided into two or three muſcles, as the *Thenar* of the hand, to draw the great toe to the reſt, as much as need requires, juſt as we ſaid of the Hand. The third anſwerable to that of the hand which is named the *Hypothenar*, paſſes from the outer part of the heel, and aſcending by the ſides of the foot it is in like manner inſerted into the ſide of the little Toe, ſo to draw it from the reſt; to which ſame action a certain fleſh contained under the ſole of the feet may ſerve, which is ſtretched even to theſe Toes, that alſo it may ſerve to hollow the foot. The muſcle equivalent to the *Thenar*. The four *Lumbrici* or wormy muſcles follow next, which from the membrane of the deep Toe-bender are inſerted into the inner and ſide part of the four toes, ſo to draw them inwards, by a motion contrary to that which is performed by the *Pedioſus*. The *Interoſſes* or bone-bound muſcles of the *Pedium* or back of the foot, remain to be ſpoken of: Theſe are eight in number, four above, and as many below, different in their originall, inſertion and action; for the upper, becauſe they draw the foot outwards with the *pedioſus*, ariſe from the fore and inner part of that bone of the *Pedium*, which bears up the little Toe (and ſo alſo the reſt each in its order) and are inſerted into the outward and fore part of the following bone. The lower on the contrary paſſe from the fore and outer part of that bone of the *Pedium*, which bears up the Great Toe (and ſo each of the reſt in its order,) but are inſerted into the inner and upper part of the following bone, ſo with the wormy muſcles to draw it inwards, or to hollow the foot as the outwards, or to flat the foot, as we ſaid of the *Interoſſes* of the hand. The 4 *Lumbrici*. The deſcription of the upper and lower *Interoſſes*.

CHAP. XLI.

An Epitome or brief recitall of the bones in a mans body.

THe whole head which hath the leaſt conſiſts of 60 bones; but that which hath moſt of 63. that is, 14 of the *Cranium* or skull, 14 or 17 of the face, and 32 teeth: Of the bones of the ſcul there be 8 containing, and 6 contained; the containing are, the *Os frontis*, or Forehead bone, the Nowle-bone, the two bones of the *Sinciput*, the two ſtony bones, the Wedgbone, and the Sive-like or ſpongy bone. But the contained are ſix ſhut up in the cavity of the Ears, the Anvil, Hammer and Sitrrop. The bones of the Scull 14.

For the bones of the face, there are ſix within or about the orb of the Eye, that is, on each ſide three; two bones of the Noſe, two leſſer Jaw bones, and two bigger, which are alwaies in beaſts ſeen diſtinguiſhed by a manifeſt difference, but it is ſo rare in men, that I have not found it as yet; therefore theſe only are diſtinguiſhed by manifeſt difference, two which contain all the upper teeth, the two inner of the palate, the two of the lower Jaw in children; And laſt of all the *Os Criſtæ*, whence the middle griſtle or partition of the Noſe ariſe. The bones of the face 15.

The two and thirty teeth are equally diſtributed in the upper and lower Jaws; and of theſe there be eight ſhearers, four tang s, or Dog teeth, and twenty Grinders. The teeth 32.

And

The bone *Hyoides*.

And there is another bone at the root of the tongue called *Os Hyoides*, alwaies composed of three bones, sometimes of four.

The bones of the spine 34. 2 Collar-bones.

Now follow the bones of the Spine, or Back-bone, which are just four and thirty, that is, seven of the neck, twelve of the chest, five of the loins, six of the holy-bone; and four of the rump. Besides there are two bones of the throat, or Collar bones.

The ribs 24. The bones of the *Sternon* 3.

The ribs are twenty four, that is, fourteen true and ten bastard ribs. The bones of the *Sternon* or Breast-bone most frequently three, otherwhiles seven, as sometimes in young bodies.

The bones of the whole arm 62.

Hence coming to the Arms there are reckoned 62, beginning with the shoulder-blade; as there are two shoulder-blades, two Arm bones; four bones of the cubit; that is, two Ell bones and two Wands; sixteen of the Wrist, eight of the Afterwrist, and thirty of the fingers; into this number also come the *Sesamoidea* or seed bones, of which some are internall, and these alwaies twelve at the least, although sometimes there may be more found, a great part of which rather merit the name of gristles, than bones; there are others externall if we beleeve *Sylvius*.

The first sheweth the forepart of the Sceleton of a man, &c.

The Declaration of these three figures put into one.

A 3. The Coronall Suture called in Greek στεφανιαία.

B 2 3. The suture like the letter λ, called λαμβδοειδῆ.

C 2. The sagittall suture called ὀβελιαία.

D 2 3. The scale-like *Conjunction* called λυπιδοειδεὶς.

α 2 3. *Os verticis*, or *Syncipitis*, the bone of the *Synciput*, called *Os* βρέγματος.

β 1 3. The forehead bone, that is, μετώπου.

γ 2 3. The bone of the nowl or ἰνίου.

δ 2 3. The bones of the temples or κροτάφων.

ε 3. An appendix in the temple bone like a Bodkin, στυλοειδὲς.

ζ 1 2 3. A processe in the temple bone like the teat of a dug, called therefore *Mamillaris* and μαστοειδὲς.

E 2 3. The wedge bone, σφηνοειδὲς.

ι 3. The stony part of the scul.

ι 3. A processe of the wedg bone much like the wing of a Bat, and therefore called πτερυγοειδὲς.

The bones of the whole leg 66.

Now remain the bones of the leg, which (if we reckon the *Ossa Ilium* on each side three, as in young bodies, it is fit they should) they are sixty six, besides the seed-bones, that is to say, two Haunch bones, two share bones, two Huckle bones, two thigh bones, two Whirlbones of the knees, four of the leg, that is, two leg bones, and two shin bones. Fourteen of the Instep, as two heel, two pastern, two boat-like, two Die, and six namelesse bones. Ten of the *Pedium* or back of the foot, that is, five in each foot; and twenty eight of the Toes: and as many seed bones in the feet, as the hands enjoy. But I have thought good to add these figures for the better understanding of what hath been spoken hereof.

The

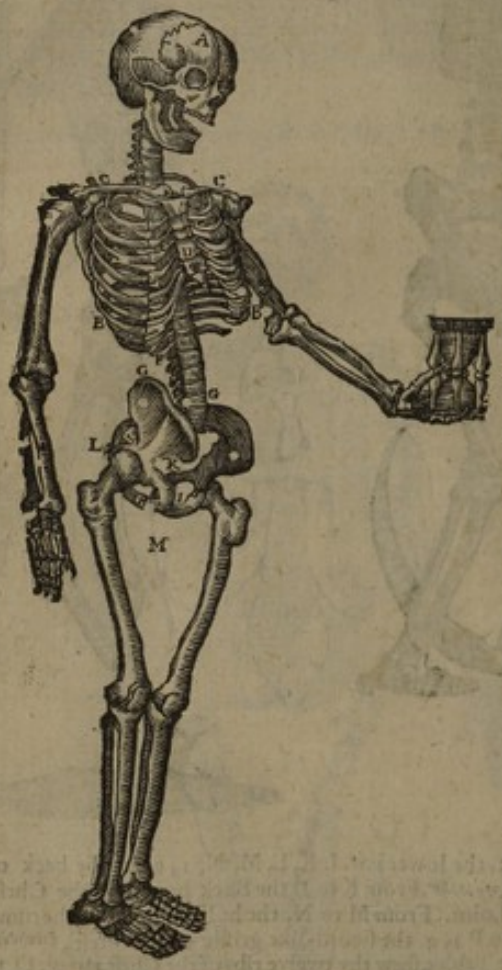
The 2 and 3 Figure sheweth the back side of the Sceleton, and the laterall part of the Sceleton.

F 1, 2, 3. the yoak bone ζυγον. G 1, 3. the lower jaw. I, K, L, M, N. 1, 2, 3. the back or the spine, ραχις. From I to K, the neck, τραχηλος. From K to L, the Rack bones of the Chest. From L to M, the rack bones of the Loins. From M to N, the holy bone ιερον. N, the rump bone, κοκκυξ. O, 1, 3. the brest bone στερνον. P 1, 3. the sword-like gristle of the brest, ξιφοειδες. Char. 1, 3. as far as to 12. in all three Tables, shew the twelve ribs of the Chest, πλευραι. Q 1. the clavicles or collar bones, κλειδες. R, 1, 2, 3. the shoulder-blade, ωμοπλατες. S, 1, 2, 3. The upper processe of the shoulder blade, or the top of the shoulder, called ακρωμιον. μ, 1, 3. the lower processe of the shoulder blade, called ωλενοκρανιον. S 1, 2. the bone of the arm, called *Humerus* and βραχιων. T V 1, 2, 3. the cubit πηχυς. X 1, 2, 3. the wand or the upper bone of the Cubit, called καρυς. Y 1, 2, 3. the ell or lower bone of the Cubit, called πηχυς. ' 3. the processe of the cubit, ωλενοκρανιον. ξ 13. the processe like a bodkin or probe, called τορνος. ZZ. 1, 2, 3. the wrist καρπος. Γ 1, 3. the Afterwrist μετακαρπιον. ΔΔ. 1. the fingers δακτυλοι. Θ 1, 2, 3. the bones joined to the sides of the holy bone, on each side distinguished as it were into three parts. ε 1, 2, 3. the first part called the Hanch bone *Os Ilium*, λαγονων. π 1, 2, 3. the second part the bone of the *Coxendix* ἰσχιον. ρ 1, 2, 3. the third part the share bone, *Os pubis*, ἠβικον. σ 1, 2, 3. a gristle going between the conjunction of the share bones. Λ 1, 2, 3. the thigh, μηρος, τ 1, 2, 3. the greater outward processe of the thigh called *Rotatores* τροχαντηρ μειζων. υ 1, 2, 3. his lesser and inner processe. χ 1, 2, 3. the whirlbone of the knee, *Patella Rotatula*, ἐπιμηλιον. Π Σ 1, 2, 3. the leg, κνημη. Φ 1, 2, 3. the inner and greater bone of the leg, σφυρον. Ψ, 1, 2, 3. the utter and smaller bone of the leg, called the Brace bone, *Fibula*, περονη. φ 1, 2, 3. the processe of the leg or the inner ankle called *Malleolus internus*. X, 1, 2. the processe of the brace of the outward ankle, both of them are called in Greek σφυρον. Ω 1, 2, 3. the bone called the cockall,

Talus,

Talus, ha liſta, *Os* πτερνικὸν. *a*, 2, the Heel *Calx*, πτέρνα. *b* 1, 3. the bone called *Os Naviculare*, σκαφοειδὲς. *cc*, 1, 2, 3. the wriſt of the foot called *Tarſus*, conſiſting of four bones, ταρσὸς. *d*, *e*, *f*. 1, 2, 3. three inner bones of the wriſt of the foot, called by ſome κυνοειδῆ. *g* 1, 2, 3. the utter bone of the wriſt of the foot like a Die, κυβοειδὲς. *hh* 1, 2, 3. the Afterwriſt of the foot called *Pedium*, by ſome μετατάρσιον. *ii*, 1, 2, 3. the toes of the foot. *k* 1, 2, 3. the ſeed bones of the foot, called *oſſicula ſeſamina* σησαμοειδῆ.

This figure ſheweth the Sceleton of the bones and griſtles of a woman, that it may appear all her bones are in proportion leſſer than the bones of a man. But in this figure only thoſe parts are marked with letters wherein a woman differeth from a man in her bones and griſtles.



A, The ſagittall ſuture deſcending into the noſe, and dividing the fore-head bone, which is ſometimes found in women, very rarely in men, but alwaies in infants.

BB, The Cheſt ſomewhat depreſſed before, becauſe of the Paps.

CC, the collar bones not ſo much crooked as in men, nor intorted ſo much upward.

D, the breſt bone perforated ſometimes with a hole much like the form of a heart, through which veins do run outward, from the mammary veins unto the paps.

E, the griſtles of the ribs, which in women are ſomewhat bony, becauſe of the weight of the Dugs.

F, a part of the back reflected, or bent backward above the loins.

GG, the compaſs of the hanch bones running more outward, for the womb to reſt upon, when a woman is with child.

HH, the lower proceſſes of the ſhare bones, bearing outward, that the cavity marked with K, might be the larger.

I, the anterior commiſſure or conjunction of the ſhare-bones filled up with a thick griſtle, that in the birth they might better yeeld ſomewhat for natures neceſſity.

K, a great and large cavity circumſcribed by the bones of the coxendix and the Holy-bone.

L, The rump or coccyx, curved backward to give way in the time of the birth.

M, the thigh bones by reaſon of the largeneſſe of the foreſaid cavity, have a greater diſtance betwixt them above, whence alſo it is that womens thighs are thicker than mens.

CHAP. XLII.

An Epitome of the names and kinds of compoſure of the bones.

BEcauſe it is as neceſſary for a Chirurgeon to know the manner of ſetting and repairing broken bones, as to put them in their places when they are diſlocated, or out of joynt; but ſeeing neither of them can be underſtood when the naturall connexion of the bones is not knowne, I have thought it a worke worth my labour, briefly to ſet down, by what and how many means the bones are mutually knit and faſtned together. The univerſall compoſure and ſtructure of all the bones in a mans body is called by the Greeks *Sceletos*. But all theſe bones are compoſed after two ſorts, that is, by *Arthron*, an Articulation or joint, and by *Symphyſis* a naturall uniting or joining together.

What the *Sceleton* is.

The

There are many other kinds both of theſe ſorts. For there are two kinds of Articulation, that is, *Diarthroſis*, or Dearticulation, and *Synarthroſis*, or Coarticulation; which differ as thus, Dearticulation is a compoſition of the bones with a manifeſt and viſible motion; Coarticulation hath a motion of the bones, yet not ſo manifeſt, but more obſcure. But theſe two do again admit a ſubdiviſion into other kinds. For *Diarthroſis* contains under it *Enarthroſis*, *Arthrodia*, and *Ginglymos*. Now *Enarthroſis* or Inarticulation is a kind of Dearticulation, in which a deep Cavity receives a thick and long head, ſuch a compoſition hath the Thigh-bone with the Huckle-bone.

2 Sorts of Articulation.
What *Diarthroſis* and *Synarthroſis* are.
3 Sorts of *Diarthroſis*.
What *Enarthroſis* is.

Arthrodia is when a lightly engraven cavity admits a ſmall and ſhort head; ſuch a connexion is that of the arm-bone with the ſhoulder-blade; of the firſt *vertebra* with the ſecond. The Greeks have diſtinguiſhed by proper names theſe two kinds of Cavities and heads; For they call the thick and long head *Cephale*, that is, a Head abſolutely; but the leſſer they term *Corone*, or *Coronion* which the Latines call *Capitulum*, a Little-head. But they call a deep Cavity *Cotyle*, and a ſuperficiary one *Glene*. The third ſort called *Ginglymos*, is when the bones mutually receive and are received one of another; as when there is a cavity in one bone, which receives the head of the oppoſite bone, and alſo the ſame bone hath a head which may be received in the Cavity of the oppoſite bone; ſuch a compoſure is in the Cubit knee, that is in the connexion of the Thigh-bone.

What *Arthrodia*.
What *Cephale* is.
What *Corone* is.
What *Cotyle* is.
What *Glene* is.
What *Ginglymos*.

And thus much of Dearticulation and the three kinds thereof. *Synarthroſis* or Coarticulation, another kind of juncture, hath alſo three kinds thereof (*Gal. lib. de Oſſibus*) to wit, *Sutura*, *Gomphoſis* and *Harmonia*.

3 kinds of *Synarthroſis*.

Suture is a compoſition of the bones after the manner of ſowing things together, example whereof appears in the bones of the Skull. *Gomphoſis* is when one bone is faſtened in another as a pin is faſtened in a hole, after which manner the teeth are faſtened in their ſockets in both the Jaws. *Harmony* is when the bones are compoſed by the interpoſition of a ſimple line, after which manner many bones of the noſe and face are joined together.

What a Suture is.
What *Gomphoſis* is.
What *Harmonia* is.

Hitherto we have ſpoken of the firſt conſtruction of the bones by articulation and the kinds thereof; now it follows we treat of *Symphyſis*.

Symphyſis, or growing together, as we formerly ſaid, is nothing elſe, than naturall union of the bones; ſuch union is made two manner of wayes, that is, either by interpoſition of no other thing; after which ſort in ſucceſs of time the bones of the lower Jaw grow together, which formerly in children were manifeſtly diſtinguiſhed; or by the mediation of ſome *Medium*; but that happens three manner of wayes, by interpoſition of three ſeverall *Media*, as firſt of a Griſtle, which kind of union the Greeks cal *Synchondroſis*, after which manner the Share-bones grow together and alſo ſome *Appendices* in young bodies; ſecondly, of a Ligament, and it is named by the Grecians *Syneuroſis*, the Name of a Nerve being taken in the largeſt ſenſe, for ſometimes it is uſed for a tendon, otherwhiles for a Ligament, otherwhiles for a Nerve properly ſo called and which is the author of ſenſe and motion. But this *Symphyſis* or union hath place by *Syneuroſis*, or interpoſition of a Nerve, in certain bones of the *Sternon* and Haunch.

What *Symphyſis* is.
Synchondroſis.
Syneuroſis.
The things ſignified by the word Nerve.

Thirdly, the bones grow into one by interpoſition of fleſh, called in Greek *Synſarcoſis*; thus the fleſh of the Gums faſten the teeth and makes them immoveable. But if ſome be leſs pleaſed with this diviſion, by reaſon of the obſcurities, in which it ſeems to be involved, this following expreſſion comes into my mind, which I was firſt admoniſhed of by *German Cortin* Doctor of Phyſick, which if you well obſerve it, is both blameleſs and more eaſie for your underſtanding.

Synſarcoſis.

An Epitome or brief recitall of all the Muſcles of mans body.

As I have formerly reckoned up the bones, ſo here, I have decreed to recite the muſcles of mans body. Wherefore in the face we firſt meet with the broad or skin muſcle ariſing from the fleſhy pannicle, and covering the whole neck and almoſt all the face. Then follow 4, pertaining to the upper eye-lids. In the Orbs of the eyes lye 14, that is 7, in each Orb, of which 4 are called right, two oblique, and one pyramidall. Then ſucceed 4 of the noſe, two externall on each ſide one, and two internall, theſe draw it together and the other open it. After theſe come the ten muſcles of the lower Jaw, of which two are called the *Crotaphitæ* or Temporall; two *Maſſeteres* or Grinders; two round (which ſeem to mee rather to pertain to the lips, than to this Jaw;) two little ones hid in the mouth, ariſing from the winged proceſs of the wedg-bone; two openers of the mouth being nervous or tendinous in their midſt. Then follow the 8 muſcles of the lips, that is, 4 of the upper, and as many of the lower, ſhutting and opening the mouth. The tongue with his ten muſcles is hid as it were in the den of the mouth. Wherefore the muſcles of the whole face are 51. In the fore part of neck are found the muſcles of the bone *Hyoides* and throttle; now 8 muſcles hold the bone *Hyoides* as equally ballanced; of which there are 2 upper ariſing from the Chin; 2 on the ſides from the proceſſe *Styloides*, perforated in their midſt, through which the 2 openers of the mouth in that part nervous do paſs; 2 ariſe from the *Sternon*, and laſtly 2 from the upper rib of the ſhoulder-blade to the *Coracoides*, which alſo in their midſt are nervous, in which place the two *Maſtoidei* lye upon them.

The

United mutually by *Symphyſis* or union; by which they are ſo conjoined that there is no diſſimilar, nor heterogenous body, at leaſt which may be diſcerned, interpoſed between them. Such union appears in the two bones of the lower Jaw at the Chin, in the bones of the *Sternon*, the Hanch with the Huckle-bones, and the Share-bones between themſelves; of this union there are no more kinds, for by this it cometh to paſs, that the bones which were more and diſtinct meet together by interpoſition of one *Medium*, to wit, a Griſtle, which now indeed is no Griſtle, but is turned into a Bone.

The bones, which as pillars ſuſtain the fabrick of the whole body, are either

- United mutually by *Symphyſis* or union; by which they are ſo conjoined that there is no diſſimilar, nor heterogenous body, at leaſt which may be diſcerned, interpoſed between them. Such union appears in the two bones of the lower Jaw at the Chin, in the bones of the *Sternon*, the Hanch with the Huckle-bones, and the Share-bones between themſelves; of this union there are no more kinds, for by this it cometh to paſs, that the bones which were more and diſtinct meet together by interpoſition of one *Medium*, to wit, a Griſtle, which now indeed is no Griſtle, but is turned into a Bone.
- or Conjoined by that which they call *Arthrodia*, or Articulation, as when they ſo concur & are bound together, that ſome Heterogeneous ſubſtance may be noted betwixt them, but the bones thus compoſed are knit two manner of wayes, that is,
  - either more looſly as by *Diarthroſis*, that is a kind of Articulation not very ſtrait, as by which it might have opportunity to perform diverſe motions: of this compoſure or Articulation of bones there are three kinds, as
    - *Enarthroſis*, when the head of a bone is wholly received in the cavity of another, and hid therein, as the Thigh-bone is joyned with the Huckle-bone.
    - *Arthrodia*, when in a lightly engraven and not much depreſſed cavity the head of another bone is not wholly hid, but only received in part thereof; ſo that unleſs nature had otherwiſe provided a ſufficient receptacle for the head of this bone (as by the ligaments of the neighbouring Muſcles) it would otherwiſe have been in perpetuall danger of diſlocation. Thus the Arm-bone is faſtened to the ſhoulder-blade.
    - *Ginglymos*, when the bones mutually receive each other, ſuch like compoſition hath the Cubit and Arm-bone.
  - or more ſtraitly, as by *Synarthroſis*, when the bones are more ſtraitly knit ſo that they can perform no motions in the body. Of this Articulation there are alſo 3 kinds, that is,
    - *Gomphyſis*, as when one bone ſo receives another as a Pin is faſtened in the hole made by a piercer, thus the teeth are faſtened in the Jaws.
    - *Sutura*, like a Saw, or teeth of a combe; as the bones of the skull are mutually knit together, or as ſcales, or tiles are laid, after which manner the ſtony bones are faſtened to theſe of the *Sinciput*.
    - *Harmonia*, which is by interpoſition of a ſimple line, which parts bones abutting one upon another, as the bones of the Noſe.

The 18. of the *Larinx*.

The Throttle compoſed of three griſtles hath eighteen or twenty muſcles, of which ſix or eight are common, and twelve proper; Of the common there are two above, two below, and two at the ſides of the firſt griſtle, to which we may add theſe two which ſerve for the opening of the *Epiglottis*, which are alwayes found in great four-footed beaſts for to preſs down the *Epiglottis*.

The proper are twelv, ewhich almoſt all of them come from the ſecond griſtle, ſo to be inſerted into the firſt and third, of which ſome are before, others behind the *Thyroides*. Beſides theſe there are the *Maſtoidei* which bend the head.

The head is moved by 14 Muſcles.

But in the back part of the Neck there are twelve muſcles alſo appointed for to move the head, ſo that in all there are fourteen muſcles ſerving for the motion of the head, the two fore *Maſtoidei*, and the twelve hind muſcles, that is to ſay, the two *Splenii*, two *Complexi*, four Right, and ſo many oblique, which are very ſhort, ſo that they paſs not beyond the firſt and ſecond *vertebra*.

The 8. muſcles of the neck.

The Neck hath eight Muſcles, of which two are called the long, lying before upon the bodies of the *Vertebræ*; the two *Scaleni*, which are at the ſides; the two *Spinati*, which run alongſt the Spine; the two tranſverſe, which go to the tranſverſe proceſs of the Cheſt.

The Muſcles of the cheſt 81

The Cheſt hath 81 Muſcles, of which ſome are on the fore part, ſome on the hind, others on the ſides; they are all combined and coupled together except the Midriffe. Now of theſe there are the two *Subclavii*; the two great Saw-muſcles which proceed from the baſis of the ſhoulder-blade; the four little *Rhomboides* or ſquare muſcles, that is, two above, and two below; the two *Sacrolumbi*, the two binders of the Griſtles within the Cheſt.

Beſides there are twenty and two externall and as many internall Intercoſtall muſcles, twenty four *Intercartilaginei*, that is, twelve externall and as many internall; ſo that the Intercoſtall, and *Intercartilaginei* are 68, which with the twelve before mentioned make the number of 80 Muſcles. Add to theſe the Midriffe being without an aſſociate, and you ſhall have the number formerly mentioned, to wit, 81. But alſo if you will add to theſe the Muſcles of the lower belly, I will not much gainſay it, becauſe by accident they help inſpiration and exſpiration.

The 8. muſcles of the lower belly.

Wherefore of the eight muſcles of the *Epigaſtrium*, there are four oblique, of which two are deſcendent and ſo many aſcendent; two right, to which you may add the two Aſſiſting

or

or Pyramidall muſcles which come from the ſhare-boue, if it pleaſe you to ſeparate them from the head of the right muſcles.

There are ſix or eight muſcles of the Loins, of which two bend the loins, which are the triangular; the two *Semiſpinati*; two *Sacri*; two are in the midſt of the back, which for that cauſe we may call the *Rachitæ* or chin-muſcles. Now, that hereafter we may ſeverally and diſtinctly ſet down the muſcles of the exereme parts, we will come to the privities. The 6. or 8. of the loins.

Where for the uſe of the teſticles there are two muſcles called the *Cremaſteres*, or Hanging muſcles. At the root of the yard, or *Perinæum*, there are four others, partly for the commodi ous paſſing of the urin and ſeed, and partly for erecting the yard. The *Sphincter* muſcle is ſeated at the neck of the Bladder. The two Cremaſters of the Teſticles.

At the end of the right gut are three muſcles, two *Levatores Ani*, or lifters up of the ſundament, and one *Sphincter* or ſhutting muſcle. Now let us proſecute the muſcles of the extremities, or limbs. But it will be ſufficient to mention only the muſcles of one ſide, becauſe ſeeing theſe parts of the body are double, thoſe things which are ſaid of the one may be applyed to the other. The three of the ſundament.

Wherefore the muſcles of the Arm, beginning with theſe of the ſhoulder-blade, at the leaſt, are 42. for there are four of the ſhoulder-blade: of the Arm properly or particularly ſo called, ſeven or eight; and there are three, four or five proper muſcles of the Cubit; that is, appointed for the performance of the motions thereof; in the inner part of the Cubit are ſeven, and as many in the outer; but thoſe of the hand are reckoned thirteen at the leaſt. The muſcles of the Arm in generall 32.

The fourth of the ſhoulder-blade are the *Trapezius* reſembling a Monks Cowl, which moves it upwards and downwards, and draws it backwards; the ſecond is the *Levator*, or lifter-up; the third the great *Rhomboides* lying under the *Trapezius*. The fourth, the leſſer ſaw muſcle which is inſerted into the *Coracoides*. The arm is moved forwards, backwards, upwards, downwards and circularly.

The Pectorall muſcle ariſing from the Clavicle, Breſt-bone and neighbouring ribs, draws it forwards; the *Humilis* or low muſcle coming from the lower rib of the ſhoulder-blade draws it backwards; the *Deltoides* upwards; and the *Latiſſimus* downwards, and ſomewhat backwards. But the three ſeated about the ſhoulder-blade move it about, or circularly.

The *Epomis* or *Scapularis* upwards; the *Superſcapularis*, which may ſeem two, backwards and downwards; the *Subſcapularis* which is in the Cavitie of the ſhoulderblade, forwards, ſo that by a certain viciſſitude and ſucceſſion of action they move it circularly. Two muſcles bend the Cubit, the one named *Biceps* or twoheaded, and the other *Brachiæus* or the Arm muſcle; but one, two or three muſcles extend it; for if you have reſpect to the original, this muſcle hath two or three heads, but one only inſertion.

In the inſide of the cubit are ſeven muſcles, one *Palmaris*, two wriſt benders; two *pronatores*, one ſquare, another in ſome ſort round; two finger benders, and one *Abductor* or Drawer aſide. Theſe fourteeen internall and externall muſcles of the Cubit, do not indeed move the Cubit, but only ſeated there move the wand and with it the hand. Theſe are the thirteen muſcles of the hand; the *Thenar* which may not only be divided into two, but into ſix, not only by the diverſe actions it performs, but alſo by the branches divided by a manifeſt ſpace between them; the ſecond is called the *Hypothenar*, which lies under the little finger, as the *Thenar* doth under the thumb; the third is the *Abductor* of the thumb; then follow the four *Lumbrici* and ſix *Interoſſes*, although eight may be obſerved.

The whole leg hath at the leaſt 50 muſcles, for we reckon there are fourteen muſcles in the thigh; there are eleven made for the uſe of the Leg; there are nine ſeated in the Leg, three before, and ſix behind, which ſerve for the uſe of the foot and toes; in the foot are ſeated ſixteen. Therefore of the fourteen muſcles ſerving the thigh two bend it, one called the *Lumbaris*, the other ariſing from the cavity of the Hanch bone; but the three which make the Buttocks and the *Triceps* or Three-headed muſcle, (which if you pleaſe, you may divide into three) extend it. Beſides theſe the four twin muſcles, and two *Obturators*, of which the one is internal, and the other external turn the thigh about. The leg hath eleven; that is, the Long, the membranous, the four *Poſtici* or hind muſcles (three of which come from the Huckleboue, but the other from the commiſſure of the Share bone) the right, the two vaſt, the *Crureus* or Leg muſcle, and the *Popliteus*, or ham muſcle. Theſe ſeated in the leg for the uſe of the foot and toes are three fore, and ſix hind muſcles: two of the fore bend the foot, one of which is called the *Tibiæus anticus*, the other *Peroneus*, which you may divide into two. The third the bender of the toes, although it alſo partly bend the foot, to which alſo the bender of the thumb may be revoked. One of the hind is the Toe-bender, others extend the foot; and are in this order; two Twins, one *Plantaris*, one *Soleus*, one *Tibiæus poſticus* and the great bender of the toes, to which may be revoked the bender of the thumb. Of the ſixteen ſeated in the foot, one is above, ſeated on the back of the foot, which wee call the *Abductor* of the Toes; another in the ſole of the foot; to wit, the little bender of the Toes, which goes to the ſecond joint of the Toes alongſt the inſide of the foot; the other lends his help to the great Toe, which you may call the *Abductor* of the thumb; ano- The muſcles of the leg in generall 50.

ther is ſeated on the outſide for the uſe of the little toe. To theſe are added the four *Lumbrici*, beſides the eight *Interoſſes*; or if you had rather, ten. And thus much may ſuffice for the enumeration of the muſcles.

The Figure of the muſcles when the skin with its veins, the fat, and all the fleſhy membranes are taken away, that part of the fleſhy membrane excepted, which takes upon it the nature of a muſcle, as being conjoined with the muſcles.

a, the muſcle of the forehead.
b, the temporall muſcle.
c, the muſcle ſhutting the eyelid.
d, the muſcle opening the wings of the noſe.
e, the fore part of the yoak-bone.
f, the muſcle of the upper lip tending to the noſe.
g, the beginning of the maſſeter or grinding muſcle.
h, the broad muſcle conſiſting of a fleſhy membrane.
i, *k*, the beginning therof which riſes immediatly from the coller-bone and the top of the ſhoulder.
l, that part thereof which bends forwards to *j*.
m, the muſcle which lifts up the arm.
n, the pectorall muſcle.
o, the membranous part of this muſcle which is joined to the nervous part of the firſt muſcle of the *Abdomen*, or belly.
q, *q*, the fleſhy portion thereof, from the 6 and 7 ribs, and the inſertion thereof. *r* the muſcle drawing down the arm. *ſ*, the oblique deſcending muſcle of the lower belly. *t*, *t*, *t*, the inſertion of the greater ſaw muſcle. u u. the *linea alba* or white line, at which the two oblique deſcendent muſcles meet, covering the whole belly. *x*, the yard, the skin being taken away. *y*, the veſſels of ſeed. *z*, the teſticles wrapped in the fleſhy membrane. *β*, the fore muſcle bending the cubit. *γ*, *γ*, the hind muſcle bending the cubit. *δ*, the muſcle extending the cubit. *ε*, the two-headed muſcle extending the wriſt. *ζ*, the muſcle producing the broad tendon on the back of the hand. *ζ*, his tendon. *η*, the muſcle turning up the Wand. *θ*, the upper muſcle flatting the Wand. *ι*, the ſecond of the arm-benders, whoſe beginning is *κ*, and tendon *λ*. *ο*, a portion of the muſcle, whereof one part yeelds tendons to the wriſt, the other to the thumb. *π*, the fleſhleſſe articulation of the thumb. *ρ*, a muſcle inſerted into the wriſt, lying neer to the following muſcle. *σ*, a muſcle divided into two tendons, the one whereof is inſerted into the firſt joint of the thumb, the other into the following. *τ*, the firſt muſcle of the thigh, whoſe head is at *υ*, and tendon at *φ*, and inſertion at *χ*. *ψ*, the end of the ſecond muſcle of the thigh. *ω*, the end of the third muſcle of the thigh. 1, the ſixt muſcle of the leg; his beginning at 2. almoſt wholly membranous at 3. 4, the ninth muſcle of the leg. 5, the eight of the leg. 6, a portion of the ſixth and ſeventh of the thigh. 7, the Glandules of the groins. 8, the eight of the thigh. 9, the ſecond of the leg. 11, the innermoſt of the ankle. 12, the ſixth muſcle of the foot, his originall 13. end 14. 15, the ſeventh of the foot. 16, the tendon of the muſcle lifting up the great toe. 17, the muſcles extending the four other toes. 18, the abductor of the great toe. 19, a tranſverſe ligament. 20, a tendon of the ninth muſcle of the foot. 21, the firſt muſcle. 22, the fourth muſcle of the foot. 23. the tendon of the third muſcle. 24, a muſcle bending the third bone of the four leſſer toes.

The

THE SEVENTH BOOK Of Tumors againſt Nature in generall.

CHAP. I.

What a Tumour againſt Nature, vulgarly called an Impoſtume, is, and what be the differences thereof.

What an Impoſtume vulgarly ſo called is.

The materiall cauſes of Impoſtumes, or unnatural tumors.

AN Impoſtume, commonly ſo called, is an affect againſt nature, compoſed and made of three kinds of diſeaſes, Diſtemperature, ill Conformation, and Solution of Continuity, concurring to the hindering or hurting of the Action. An humor, or any other matter, anſwering in proportion to a humor, aboliſhing, weakning, or depraving of the office or function of that part or body in which it reſides, cauſeth it.

The differences of Impoſtumes are commonly drawn from five things; quantity, matter, accidents, the nature of the part, which they affect or poſſeſs; and laſtly, their efficient cauſes. I have thought good for the better underſtanding of them, to deſcribe them in this following Scheme.

A Table of the differences of Tumors.

The differences of Impoſtumes are drawn principally from five things, that is,

- From their quantity, by reaſon whereof *Impoſtumes* are called
  - Great, which are comprehended under the generall name of Phlegmons, which happen in the fleſhy parts, by *Galen*, *Lib. de tumor. contra naturam, & lib. 2. ad Glauconem.*
  - Indifferent, or of the middle ſort, as Fellons.
  - Small, as thoſe which *Avicen* calls *Bothores*, i. Puſhes and Puſtules, all kind of Scabs and Leproſies; and laſtly, all ſmall breakings out.
- From their accidents, as
  - Colour, from whence Impoſtumes are named white, red, pale, yellow, blew or black, and ſo of any other colour.
  - Pain, hardneſs, ſoftneſs, and ſuch like, from whence they are ſaid to be painfull, not painfull, hard, ſoft, and ſo of the reſt.
- From the matter, of which they are cauſed and made, which is either
  - Natural
    - Hot, and that either
      - Sanguin, from whence a true *Phlegmon.*
      - Cholerick, frō whence a true *Eryſipelas.*
    - Cold, & that either,
      - Phlegmatick, frō whence a true *Oedema.*
      - Melancholick, frō whēce a perfect *Scirrhus.*
  - or
  - Not naturall, which hath exceeded the limits of its naturall goodneſſe, from whence illegitimate tumors, therefore
    - of a ſanguine humour,
      - Carbuncles, Gangrenes, eating ulcers, Sphacels are cauſed.
    - of a cholerick humour,
      - Of the groſſer, the eating *Herpes*, of the ſubtiler the *Herpes miliaris* is made.
    - of a phlegmatick humour,
      - Watery and flatulent Impoſtumes, the Kings evil, knots and al phlegmatick ſwellings and excreſcences.
    - of a melancholick humour.
      - The exquiſit or perfect *Scirrhus*, hardneſſes and all ſorts of cancerous Tumors.
- From the condition and nature of the parts which they poſſeſs, from whence the *Opthalmia*, is a Phlegmon of the eyes. *Parotis* a tumor neer the ears. *Faronychia* or a whitlow at the roots of the nails; and ſo of the reſt.
- From the efficient cauſes, or rather the manner of doing. For ſome impoſtumes are ſaid to be made by defluxions, others by congeſtion, thoſe are commonly hot, and the other commonly cold, as it ſhal more manifeſtly appear by the following chapter.

CHAP. II.

Of the generall cauſes of Tumors.

After what manner tumours againſt nature are chiefly made.

THere are two generall cauſes of Impoſtumes, Fluxion, and Congeſtion. Defluxions are occaſioned, either by the part ſending, or receiving; the part ſending diſcharges it ſelf of the humors, becauſe the expulſive faculty reſident in that part is provoked to expell them, moved thereto, either by the troubleſomneſs of their quantity or quality. The part receiving draws, and receives occaſion of heat, pain, weakneſſe (whether naturall, or accidentall) openneſſe of the paſſages, and lower ſituation.

Three cauſes of heat.

The cauſes of heat, in what part ſoever it be, are commonly three, as all immoderate motion (under which frictions are alſo contained,) externall heat, either from fire or ſun, and the uſe of acrid meats and medicines.

Four cauſes of pain.

The cauſes of pain are four, the firſt is a ſodain and violent invaſion of ſome untemperate thing, by means of the four firſt qualities; the ſecond is ſolution of continuity, by a wound, luxation, fracture, contuſion, or diſtention; the third, is the exquiſit ſenſe of the part, for you feel no pain in cutting a bone, or expoſing it to cold or heat; the fourth is, the attention, as it were, of the animall faculty; for the mind diverted from the actuall cauſe of pain, is leſſe troubled, or ſenſible of it.

Two cauſes of weakneſſe.

A part is weak, either by its nature, or by ſome accident; by its nature, as the Glandules and the Emunctories of the principall parts; by accident, as if ſome diſtemper, bitter pain, or great defluxion have ſeized upon it, and wearied it, for ſo the ſtrength is weakned, and the paſſages dilated. And the lowneſſe of ſite yeelds opportunity for the falling down of humors.

Two cauſes of congeſtion.

The cauſes of congeſtion are two principally, as the weakneſſe of the concoctive faculty, which reſides in the part, (by which the aſſimilation into the ſubſtance of the part of the nouriſhment flowing to it is fruſtrated) and the weakneſſe of the expulſive faculty; for whilſt the part cannot expell ſuperfluities, their quantity continually encreaſes.

And thus oftentimes cold Impoſtumes, have their originall from a groſſe and tough humor, and ſo are more difficult to cure.

Laſtly, all the cauſes of Impoſtumes may be reduced to three; that is, the primitive, or externall; the antecedent, or internall; and the conjunct, or containing, as we will hereafter treat more at large.

CHAP. III.

The ſignes of Impoſtumes or Tumors in generall.

The principall ſigns of tumors are drawn from the eſſence of the part.

BEfore we undertake the cure of Tumors, it is expedient to know their kinds and differences, which knowledg muſt be drawn from their proper ſigns, the ſame way, as in other diſeaſes. But becauſe the proper and principall ſigns of tumors are drawn from the eſſence of the part they poſſeſſe, we muſt firſt know the parts, and then conſider what their eſſence and compoſition are.

We are taught both by skill in Anatomy, and the obſervation of the deprived function, eſpecially when the affected part is one of thoſe which lie hid in the body; for we know whether or no, the externall parts are affected with a tumor againſt nature, by comparing that with his naturall which is contrary. For comparing the ſound part with the diſeaſed, we ſhall eaſily judge whether it be ſwollen, or no.

But becauſe it is not ſufficient for a Chirurgeon only to know theſe generall ſigns (which are known even to the vulgar) he muſt attentively obſerve ſuch as are more proper and neer. And theſe are drawn from the difference of the matter and humors, of which the tumors conſiſt.

Lib. 2. ad Glauc. & 13. method.

For this *Galen* teaches, that all differences of tumors ariſe from the nature and condition of the matter which flows down and generates the tumor; alſo they are known by ſuch accidents as happen to them, as colour, heat, hardneſs, ſoftneſs, pain, tenſion, reſiſtance.

The proper ſigns of a ſanguin tumor, of a phlegmatick, of a melancholick, of a cholerick.

Wherefore pain, heat, redneſſe, and tenſion indicate a ſanguine humour; coldneſs, ſoftneſſe, and no great pain, phlegm; tenſion, hardneſs, the livid colour of the part, and a pricking pain by fits, melancholy; and yellowiſh and pale colour, biting pain without hardneſs of the part, choler.

The knowledg of tumors by their motion and exacerbation.

Lib. 2. Epidem.

And beſides, Impoſtumes have their periods and exacerbations following the nature and motion of the humors of which they are generated. Wherefore by the motion and fits it will be no difficult matter to know the kind of the humor; for as in the ſpring, ſo in the morning the blood is in motion; as in the ſummer, ſo in the midſt of the day, choler; as in Autumn, ſo in the evening, melancholy; as in Winter, ſo in the night the exacerbation of phlegm are moſt predominant. For *Hippocrates* and *Galen* teach, that the year hath circuits of diſeaſes, ſo that the ſame proportion of the exceſs and motion of humors, which is in the four ſeaſons of the year, is alſo in the four quarters of each day. Im-

Impoſtumes which are curable have four times, their beginning, encreaſe, ſtate, and declination, and we muſt alter our medicines, according to the variety of theſe times. We know the beginning by the firſt ſwelling of the part; The encreaſe, when the ſwelling, pain, and other accidents do manifeſtly encreaſe, and enlarge themſelves; the ſtate, when the foreſaid ſymptomes increaſe no more, but each of them, becauſe at their height, remain in their ſtate immoveable, unleſſe the very matter of the tumor degenerate; and change it ſelf into another kind of humor; The declination, when the ſwelling, pain, feaver, reſtleſneſſe are leſſened. And from hence the Chirurgeon may preſage what the end of the tumor may be; for tumors are commonly terminated four manner of wayes, if ſo be that the motion of the humors cauſing them be not intercepted, or they without ſome manifeſt cauſe, do flow back into the body.

The beginning of an impoſtume. The encreaſe. The ſtate.

Therefore firſt they are terminated by inſenſible tranſpiration, or reſolution; ſecondly, by ſuppuration when the matter is digeſted and ripened; thirdly, by induration, when it degenerates into a Scirrhus, the thinner part of the humor being diſſolved; the fourth, which is the worſt of all, by a corruption and Gangrene of the part, which is, when overcome with violence, or the abundance or quality of the humor, or both, it comes to that diſtemper, that it loſes its proper action.

It is beſt to terminate a tumor by reſolution; and the worſt by corruption; ſuppuration and induration are between both, although that is far better than this. The ſigns by which the Chirurgeons may preſage that an Impoſtume may be terminated by reſolving, are the remiſſion or ſlacking of the ſwelling, pain, pulſation, tenſion, heat, and all other accidents, and the unaccuſtomed livelineſs and itching of the part; and hot Impoſtumes are commonly thus terminated, becauſe the hot humor is eaſily reſolved, by reaſon of its ſubtilty.

The ſigns of a tumor to be terminated by reſolution.

Signs of ſuppuration are the intenſion or encreaſe of pain, heat, ſwelling, pulſation, and the feaver; for according to *Hippocrates*, pain and the feaver are greater when the matter is ſuppurating, than when it is ſuppurated.

The ſigns of ſuppuration.

The Chirurgeon muſt be very attentive to know and obſerve when ſuppuration is made; for the purulent matter oft-times lies hid (as *Hippocrates* ſaith) by reaſon of the thickneſs of the part lying above, or over it.

The ſigns of an Impoſtume degenerating into a Scirrhous hardneſſe, are the diminution of the tumor, and hardneſs remaining in the part. The cauſes of the hardneſs not going away with the ſwelling, are the weakneſs of nature, the groſſneſs and toughneſs of the humor, and unskilfulneſs of the Chirurgeon, who by too long uſing reſolving things hath occaſioned, that the more ſubtil part of the humor being diſſolved, the reſt of the groſſer nature like earthy dregs remains concrete in the part. For ſo Potters veſſels dried in the Sun grow hard. But the unskilfull Chirurgeon may occaſion a Scirrhous hardneſs by another means; as by condenſating the skin, and incraſſating the humors, by too much uſe of repercuſſives. But you may perceive an Impoſtume to degenerate into a Gangrene thus, if the accidents of heat, redneſs, pulſation and tenſion ſhal be more intenſe, than they are wont to be in ſuppuration; if the pain preſently ceaſe without any manifeſt cauſe; if the part wax livid or black; and laſtly, if it ſtink.

The ſigns and cauſes of a tumor terminated in a *Scirrhus*.

The ſigns of a Gangrene at hand.

But we ſhall treat of this more at large when we come to treat of the Gangrene and *Sphacelus*. A ſodain diminution of the tumor, and that without manifeſt cauſe, is a ſign of the matter fallen black, and turned into the body again, which may be occaſioned by the immoderate uſe of refrigerating things. And ſometimes much flatulencie mixed with the matter, although there be no fault in thoſe things which were applied.

Of diſappearance of a tumor, and the ſigns thereof.

Feavers and many other malign Symptomes, as ſwoundings and convulſion, by tranſlation of the matter to the noble parts, follow this flowing back of the humor into the body.

CHAP. IV.

Of the Prognoſtiques in Impoſtumes.

TUmors ariſing from a melancholy, phlegmatick, groſſe, tough, or viſcous humor, aske a longer time for their cure, than thoſe which are of bloud or choler. And they are more difficultly cured which are of humors not naturall, than thoſe which are of humors yet contained in the bounds of nature.

Cold tumors require a longer cure.

For thoſe humors which are rebellious, offend rather in quality, than in quantity, and undergoe the divers forms of things diſſenting from nature, which are joined by no ſimilitude or affinity with things naturall, as ſuet, poultis, hony, the dregs of oil, and wine; yea, and of ſolid bodies, as ſtone, ſand, coal, ſtraws; and ſometimes of living things, as Wormes, Serpents, and the like monſters.

Tumors made of matter not naturall, are more difficultly cured.

The tumors which poſſeſſe the inner parts, and noble entrails, are more dangerous and deadly, as alſo thoſe which are in the joints, or neer to them. And theſe tumors which ſeiſe upon great veſſels, as veins, arteries, and nerves, for fear of great effuſion of blood,

wasting of the spirits and convulsion. So Impostumes of a monstrous bigness are often deadly by reason of the great resolution of the spirits caused by their opening. Those which degenerate into a *Scirrhus* are of long continuance and hard to cure, as also those which are in hydropick, leprous, scabby and corrupt bodies, for they often turn into malign and ill conditioned ulcers.

Hippo. Aph. 8. sect. 6.

CHAP. V.

Of the generall cure of Tumors against Nature.

What must be considered in undertaking the cure of tumors.

THere be three things to be observed in cure of Impostumes. The first is the essence thereof; the second, the quality of the humor causing the Impostume; the third, the temper of the part affected. The first indication drawn from the essence, that is, from the greatnesse or smalnesse of the tumor, varies the manner of curing, for the medicines must be increased or diminished according to the greatnes of the tumor. The second, taken from the nature of the humor also changes our counsell, for a *Phlegmon* must be otherwise cured than an *Erysipelas*, and an *Oidema* than a *Scirrhus*, and a simple tumor, otherwise than a compound. And also you must cure after another manner a tumor coming of an humor not natural, than that which is of a natural humor, and otherwise that which is made by congestion, than that which is made by defluxion. The third Indication is taken from the part in which the tumor resides; by the nature of the part we understand its temperature, conformation, site, faculty, and function.

What we must understand by the nature of the part.

The temperature indicates that some medicines are convenient for the fleshy parts, as those which are more moist; others for the nervous, as more drie; for you must apply some things to the eye, and others to the throat; one sort of things to these parts which by reason of their rarity are easily subject to defluxion, another to those parts which by their density are not obnoxious to it.

But we must have good regard to the site of the part, as if it have any connexion with the great vessels, and if it be fit to powre forth the matter and humor when it is suppurated.

What we must understand by the faculty of the part.

Galen by the name of Faculty understands the use and sense of the part. This hath a manifold indication in curing, for some parts are principall, as the Brain, Heart, and Liver; for their vertue is communicated to the whole body, by the nerves, arteries, and veins.

What we must consider in performing the cure.

Others truly are not principall, but yet so necessary that none can live without them, as the stomach. Some are endued with a most quick sense, as the eye, the membranes, nerves, and tendons; wherefore they cannot indure acrid and biting medicines. Having called to mind these indications, the indication will be perfected by these three following intentions, as if we consider the humor flowing down, or which is ready to flow; the conjunct matter, that is, the humor impact in the part; the correction of accidents; yet so that we alwaies have care of that which is most urgent and of the cause. Therefore first repercussives must be applied for the antecedent matter, strong or weak, having regard to the tumor as it is then, only excepting six conditions of tumors; the first is, if the matter of the tumor be venenate: the second, if it be a criticall abscess: the third, if the defluxion be neer the noble parts: the fourth, if the matter be grosse, tough, and viscid: the fifth, when the matter lies far in, that is, flows by the veins which lies more deep: the sixth, when it lies in the Glandules. But if the whole body be plethorick, a convenent diet, purging and Phlebotomie must be appointed, frictions and bathes must be used. Ill humors are amended by diet and purging. If the weakness of the part receiving draw on a defluxion, it must be strengthned.

What things diffwade us from using repercussives.

If the part be inferior in its site, let the patient be so seated, or layed, that the part receiving, as much as may be, may be the higher. If pain be the cause of defluxion, we must asswage it by things mitigating it. If the thinness, or lightness of the humor cause defluxion, it must be inspissate by meats and medicines. But for the matter contained in the part, because it is against nature, it requires to be evacuate by resolving things, as cataplasmes, ointments, fomentations, cupping-glasses; or by evacuation, as by scarifying, or by suppurating things, as by ripening and opening the Impostume. Lastly, for the conjunct accidents, as the Feaver, pain and such like, they must be mitigated by asswaging, mollifying and malaxing medicines, as I shall shew more at large hereafter.

CHAP.

CHAP. XXXV.

Of the four principall and generall Tumors, and of other Impostumes which may be reduced to them.

THe principall and chief Tumors which the abundance of humors generate, are four, a *Phlegmon*, *Erysipelas*, *Oedema* and *Scirrhus*: innumerable others may be reduced to these, distinguished by divers names according to the various condition of the efficient cause and parts receiving. Wherefore a *Phygethlon*, *Phyma*, Fellon, Carbuncle, inflammation of the eyes, Squincy, *Bubo*, and lastly, all sorts of hot and moist tumors may be reduced to a Phlegmon. The *Herpes miliaris*, the eating *Herpes*, Ringwormes and Tetters and all impostumes brought forth by choler, are contained under an *Erysipelas*. *Atheromata*, *Steatomata*, *Melicerides*, the *Testudo*, or *Talpa*, *Ganglion*, Knots, Kings-Evill, Wens, watery Ruptures, the *Ascites* and *Leucophlegmatia* may be reduced to an *Oedema*, as also all flatulent tumors, which the abundance of corrupt Plegm produces.

What tumors may be reduced to a Phlegmon. Which to an *Erisipelas*. Which to an *Oedema*.

In the kindred of the *Scirrhus* are reckoned a Cancer, Leprosie, Warts, Corns, a *Thymus*, a *Varix*, *Morphew*, black and white, and other Impostumes arising from a Melancholy humor.

Which to a *Scirrhus*.

Now we will treat of these Tumors in particular, beginning with a Phlegmon.

CHAP. VII.

Of a Phlegmon.

A Phlegmon is a generall name for all Impostumes, which the abundance of inflamed bloud produces. That is called a true Phlegmon, which is made of laudable bloud, offending only in quantity. But a bastard Phlegmon, or a Phlegmonous Impostume hath some other, and proper name; as a Carbuncle, Fellon, Gangrene, Sphacel, and the like malign Pustules. So when there is a conflux of divers humors into one tumor, divers kinds of Phlegmonous Impostumes called by divers names, according to the more abundant humor, arise; as if a small portion of Phlegm shall be mixed with a greater quantity of bloud, it shall be called an *Oedematous Phlegmon*; but if on the contrary, the quantity of phlegm be the greater, it shall be named a phlegmonous *Oedema*, and so of the rest; alwayes naming the tumor, from that which is predominant in it.

What a true Phlegmon is? A Phlegmon one thing, and a Phlegmonous tumor another.

Therefore we must observe that all differences of such tumors arise from that, either because the bloud causing it offends only in quantity; which if it do, it causes that tumor which is properly called a Phlegmon; if in quality, it makes a phlegmonous tumor, because the matter thereof is much departed from the goodness of bloud.

But bloud is said to offend in quantity, either by admixture of some other matter, as Phlegm, Choler, or Melancholy, from whence proceeds *Oedematous*, *Erysipelous* and *Scirrhous* Phlegmons; or by corruption of its proper substance, from whence Carbuncles, and all kinds of Gangrens; or by concretion, and when nature is disappointed of its attempted and hoped for suppuration, either by default of the air, or patient, or by the error of the Physitian; and hence oft times happen *Atheroma's*, *Steatoma's*, and *Melicerides*. Although these things be set down by the Ancients, of the simple and similar matter of the true Phlegmon; yet you must know, that in truth there is no impostume, whose matter exquisitely shews the nature of one, and that simple humor without all admixture of any other matter; for all humors are mixed together with the bloud, yet from the plenty of bloud predominating, they are called Sanguine, as if they were of bloud alone.

Wherefore if any tumors resemble the nature of one simple humor, truly they are not of any naturall humor, but from some humor which is corrupt, vitiated and offending in quality; for so bloud by adustion degenerates into choler and melancholy.

Therefore a true Phlegmon is defined by *Galen*; a tumor against nature, of laudable blood, flowing into any part in too great a quantity. *Gal. lib. de morbis, &c. ad Glauc. Hippoc. lib. de vulu. cap. Gal. lib. de tumor. præter naturam*

This tumor though most commonly it be in the flesh, yet sometimes it happens in the bones, as *Hippocrates* and *Galen* witness.

A Phlegmon is made and generated thus: when bloud flows into any part, in too great a quantity; first the greater veins and arteries of the affected part are filled, then the middle, and lastly, the smallest and capillary; so from those thus distended, the blood sweats out of the pores and small passages like dew; and with this the void spaces which are between the similar parts are first filled, & then with the same bloud all the adjacent parts are filled, but especially the flesh, as that which is most fit to receive defluxions, by reason of the spongious rarity of its substance; but then the nerves, tendons, membranes, and ligaments, are likewise stuffed full; whereupon a Tumor must necessarily follow, by reason of the repletion which exceeds the bounds of nature; and from hence also are tension and resistance; and

pain

pain also happens at the same time,both by reason of the tension and preternaturall heat.

The cause of a beating pain in a Phlegmon.

And there is a manifest pulsation in the part,specially whilst it suppurates, because the veins, arteries, and nerves, are much, being they are not only heated within by the influx of the fervid humor, but pressed without by the adjacent parts. Therefore seeing the pain comes to all the foresaid parts because they are two immoderately heated and pressed, the arteries, which are in the perpetuall motion of their *syſtole & diaſtole*, whilst they are dilated, strike upon the other inflamed parts, whereupon proceeds that beating pain.

Hereunto add, the Arteries then filled with more copious and hot bloud, have greater need to seek refrigeration by drawing in the encompassing Air; wherefore they must as of necessity,have a conflict with the neighbouring parts which are swollen and pained. Therefore from hence is that pulsation in a Phlegmon which is defined by *Galen*, an agitation of the arteries, painfull and sensible to the Patient himself; for otherwise as long as we are in health, we do not perceive the pulsation of the arteries.

Comm. ad Aph. 21. ſect. 7.

Wherefore these two causes of pulsation, or a pulsifick pain in a phlegmon, are worthy to be observed,that is,the heat and abundance of bloud, contained in the vessels and arteries(which more frequently than their wont incite the arteries to motion, that is, to their *ſyſtole* and *diaſtole*) and the compression and straitning of the said arteries, by reason of the repletion and distention of the adjacent parts,by whose occasion the parts afflicted and beaten by the trembling and frequent pulsation of arteries are in pain.

Hence they commonly say,that in the part affected with a Phlegmon,they feel as it were the sense or stroke of a Mallet or Hammer smiting upon it. But also besides this pulsation of the arteries, there is,as it were,another pulsation with itching from the humors whilst they putrefie, and suppurate, by the permixtion, motion,and agitation of vapours, thereupon arising.

Another kind of Pulsation in a Phlegmon.

The cause of heat in a Phlegmon is bloud, which whilst it flows more plentifully into the part, is as it were troden or thrust down,and causes obstruction, from whence necessarily follows a prohibition of transpiration,and a putrefaction of the bloud, by reason of the preternaturall heat. But the Phlegmon looks red by reason of the bloud contained in it, because the humor predominant in the part shines through the skin.

CHAP. XXIII.

Of the causes and signes of a Phlegmon.

The primitive causes of a Phlegmon. The Antecedent and conjunct.

THe causes of a Phlegmon are of three kinds; for some are primitive, some antecedent, and some conjunct. Primitive are falls,contusions,strains,immoderate labour,frictions,application of acrid ointments,burnings,long staying or labouring in the hot Sun,a diet unconsiderate,and which breeds much bloud. The antecedent causes are, the great abundance of bloud, too plentifully flowing in the veins. The conjunct,the collection or gathering together of bloud impact in any part.

The signs of a Phlegmon.

The signs of a Phlegmon are swelling,tension, resistance,feaverish heat, pain, pulsation, (especially while it suppurates) redness, and others, by which the abundance of bloud is signified.

And a little Phlegmon is often terminated by resolution;but a great one by suppuration; and sometimes it ends in a Scirrhus,or a Tumor like a Scirrhus; but otherwhiles in a Gangren, that is, when the faculty, and native strength of the part affected, is overwhelmed by the greatness of the defluxion,as it is reported by *Galen*. The Chirurgeon ought to consider all these things, that he may apply and vary such medicines as are convenient for the nature of the Patient,and for the time and condition of the part affected.

Gal. 1. de Tum.

CHAP. IX.

Of the cure of a true Phlegmon.

What kind of diet must be prescribed in a Phlegmon.

THe Chirurgeon in the cure of a true Phlegmon must propose to himself four intentions. The first of Diet; This, because the Phlegmon is a hot affect and causes a feaver,must be ordained of refrigerative and humecting things, with the convenient use of the six things not naturall, that is, air, meat and drink, motion and rest, sleep and waking, repletion and inanition; and lastly, the passions of the mind. Therefore let him make choise of that air which is pure and cleer,not too moist,for fear of defluxion,but somewhat cool; let him command meats which are moderately cool and moist, shunning such as generate bloud too plentifully, such will be broths not too fat, seasoned with a little Borage, Lettuce, Sorrell, and Succory: let him be forbidden the uses of all spices, and also of Garlick, and Onions, and all things which heat the bloud,as are all fatty and sweet things,as those which easily take fire. Let the Patient drink small wine,and much allaied with water: or if the feaver be vehement,the water of the decoction of Licoris,Barly, sweet Almonds,or water and Sugar; alwayes having regard to the strength,age,and custome of the Patient.

For

For if he be of that age,or have ſo led his life,that he cannot want the uſe of wine, let him uſe it,but altogether moderately. Reſt muſt be commanded; for all bodies wax hot by motion,but let him chiefly have a care that he do not exerciſe the part poſſeſſed by the phlegmon for fear of a new defluxion. Let his ſleep be moderate, neither, if he have a full body,let him ſleep by day, ſpecially preſently after meat. Let him have his belly ſoluble, if not by nature, then by art, as by the frequent uſe of glyſters and ſuppoſitories. Let him avoid all vehement perturbations of mind,as hate,anger,brawling; let him wholly abſtain from venery.

How to divert the defluxion of humors.

This manner of diet thus preſcribed,we muſt come to the ſecond ſcope,that is,the diverſion of the defluxion, which is performed by taking away its cauſe,that is, the fulneſs and ilneſs of the humors. Both which we may amend by purging and bloud-letting, if the ſtrength and age of the patient permit.

The pain muſt be aſſwaged.

But if the part receiving be weak, it muſt be ſtrengthned with thoſe things which by their aſtriction amend the openneſs of the paſſages,the violence of the humor being drawn away by cupping-glaſſes, frictions, ligatures. But if pain trouble the part, which is often the occaſion of defluxion, it muſt be mitigated by medicines aſſwaging pain.

When we muſt uſe repercuſſives.

The third ſcope is to overcome the conjunct cauſe. That we may attain to this, we muſt enter into the conſideration of the tumor, according to its times, that is,the beginning,increaſe, ſtate, and declination. For from hence the indications of variety of medicines muſt be drawn.For in the beginning we uſe repercuſſives to drive away the matter of the Phlegmon flowing down, as the white of an Egge, Oxycrate, the juices or waters of Houſleek, Plantain, Roſes; Cataplaſms of Henbane,Pomgranate, Pils,Balauſties, Bole armenick,*Terra ſigillata*, oil of Roſes,Quinces, Mirtils, Poppies.

Of theſe ſimples variety of compound medicines ariſes. This may be the form of a Cataplaſm.℞.*far.hordei* ℥ ij.*ſucci ſemper virvi, plantag.an.*℥ iij. *pul.malitorii,balauſtiorum & roſar.an.*ʒ ij. *ol.mirtill. & roſar.an.*℥ i. *fiat Cataplaſma.* Another, ℞, *Plantag. ſolani,hyoſcyam. an. m.* ij. *caudæ equin. tapſi barb. centinodiæ. an. m. i. coquantur perfectè in oxycrato, piſtentur, trajiciantur, addendo pulveris mirtill. nuc. cupreſſi. & roſ. rub. an.* ʒ iij. *farin. fab.* ℥ ij. *olei roſar. & cydon. an.*℥ i ß, mixe them and make a cataplaſm to the form of a liquid pultis. And you may uſe this liniment, by dipping linnen clothes in it, and applying to the part; ℞, *ol. nymph.& roſar. an.*℥ iij. *aq. roſ. ſolani & plantag. an.*℥ ij,*aceti* ℥ iij,*albumin. ovorum n.* iij. *fiat linimentum.* Alſo *ung. roſatum & ung. Album, camphor. Raſis* are good to apply to it, as in like manner, *Emp. Diacalcitheos* diſſolved in vinegar, and oil of Roſes, and alſo *Populeon* may be uſed. In the increaſe you muſt have care of the humor flowing down, and of that which already impacted in the part,did formerly fall down. Therefore repercuſſives muſt be tempered and mixed with diſcuſſing medicines, but ſo that they may carry the chief ſway, as ℞, *fol. malvæ, abſinth. plantag. an. m.* iij. *coquantur in oxycrato, contundantur, trajectis* add *farinæ fabarum & hordei an.*℥ i. *pul. roſar. rub. & Abſinth. an.*ʒ i, *ol. roſar. & chamæm. an.*℥ i,*fiat cataplaſma ad formam pultis ſatis liquidæ.* Another,℞, *farinæ hord.* ℥ iij,*farinæ ſem. lini & fænugræci, an.* ℥ i, *coquantur in aqua communi, addendo ſub finem pul. mirtillorum, roſarum & chamæmeli an.* ℥ ſſ, *axungiæ anſeris & olei roſarum an.*℥ i, *miſce, fiat cataplaſma.*

What locall medicines we muſt uſe in the encreaſe.

But in the ſtate the repercuſſives,and diſcuſſives ought to be alike with ſome anodyne, or mitigating medicines,if it be painful,as℞,*rad. Althææ* ℥ iiij,*malvæ,parietar.ana m.*ij,*coquantur ſub cineribus, addendo farin. faborum & lentium an.* ℥ ij,*pulveris chamæm.& meliloti an.* ℥ ß,*olei chamæm. & roſar. an.* ℥ i. *axungiæ gal.*℥ ij. *fiat cataplaſma.* Another, ℞, *micæ panis triticei aqua calida macerati* ℔ ß, *pulveris roſar. rub. & abſinth. ana* ℥ vi, *olei aneth. & mellis com. an.* ℥ ij, *miſce omnia ſimul & fiat cataplaſma ad formam pultis ſatis liquidæ*; which is of chief uſe when there is pain.

What in the ſtate.

What in the declination.

But when the violence of pain and other ſymptomes are aſſwaged, it is likely that the plegmon is come to determination.Wherefore then we muſt uſe more powerfull and ſtrong diſcuſſives,and only then beginning with the more gentle,leſt the ſubtiler part of the humor being diſſolved, the groſſer, remaining in the part, ſhould grow hard, as ℞, *mal. biſmal. an. m.* iij. *coquantur, addendo farinæ hordei* ℥ ij, *mellis com.* ℥ i, *ol. chamæ. & melilot. an.* ℥ ß, *fiat cataplaſma.* Or ℞, *radi cum Brion. & Cucumer. agreſt. an.* ℥ ij, *florum chamæm. & melilot. ana m.* iij, *coquantur in hydromelite addendo farinæ, ſem. lini & fænugræc. an.* ℥ ij. *ol. aneth. axungiæ anſer. & anat. an.* ℥ i. *fiat Cataplaſma.* And this plaiſter following may here find place.

℞, *Diachyl.magn.* ℥ ij, *Empl. de melilot.* ʒ i,*olei aneth.& chamæmel. an.* ℥ ß, diſſolve them all together and make a medicine for your uſe. Or ℞, *Empl.de mucag.& oxycr.an.* ℥ ij. *Empl.Diachyl. Ireat.* ℥ i, *olei liliorum & chamæmel. quantum ſatis eſt*,and make thereof a ſoft emplaiſter.

The correction of the accidents. The diſcommodities of pain.

The fourth ſcope of curing a Phlegmon conſiſts in correction of the accidents which accompany it; of which pain is the principall.

Wherefore the Chirurgeon muſt be diligent to aſſwage it;for beſides, that it weakens the ſtrength, and debilitates and depraves the function,it alſo cauſes defluxions by drawing the bloud and ſpirits to the part affected.

Medicines aſſwaging pain.

According to the variety of pain there muſt be variety of medicines, as ℞, *micæ panis albi in lacte tepido macerati* ℔ ß, *vitell. ovorum* iij, *ol. roſar.* ℥ ij, *croci* ℈ ß, *fiat cataplaſma.* Or ℞, *florum chamæm.& melil.an.p.* iij,*farinæ ſem. lini. & fænugræc. an.* ℥ i, *fiat cataplaſma pultis ſatis liquidæ.* Or ℞,*mucagin.rad. althææ & fænugræci an.* ℥ iij, *ol.roſar. & aneth.an.*℥ i,*farin. ſem.lini. quantum ſatis, ut inde formetur cataplaſma ſatis molle.*

But

Narcotick medicines.

But if the pain remain, and yeeld not to theſe remedies, we muſt flie to ſtronger, making of narcoticks, or ſtupefactives, but with care leſt we benum, or dead the part; as R, *ſol. hyoſcyani & papaver. ſub. cineribus coctorum an.* ℥ iij, *adipis ſuillæ & ol. roſ. an.* ℥ i, *croci* ℈ ij, *fiat cataplaſma*: or R, *ſol. cicutæ & ſolani furioſi. an.* ℥ iiij, *coquantur ſub cineribus, piſtentur, & trajiciantur addendo unguent. popul. & ol. roſar. an.* ℥ i, *farin. fænugræc. quantum ſatis erit ut inde formetur cataplaſma ad formam pultis liquidæ.*

CHAP. X.

The cure of an ulcerated Phlegmon.

The ſigns of a Phlegmon turning to an Abſceſs.

BUt it often happens that the humor is ſo impact in the part, that it cannot be repreſſed, and ſo groſs, that it cannot be diſcuſſed; which we may know by the greatneſs of the heat and ſwelling, by the bitterneſs of the pricking pain, the feaver, and pulſation, and heavineſs.

Lib. 2 ad Glau. Cap. 7.

Wherefore laying aſide all hope of diſcuſſing, we muſt come to the ſuppuratives. For which purpoſe *Galen* foments the ſwollen part with water, or oil being warm, or with both of them; and then applies this following cataplaſm.

Suppurative medicines.

R, *farinæ tric. vel micæ panis* ℥ iiij, *ol. com.* ℥ iij. *aquæ com. quantum ſufficit, fiat cataplaſma*; Or R, *rad. lilior. alb. & altheæ, an.* ℥ iij, *fol. malvæ, parietar. & ſenecionis ana m. i. coquantur in hydromelite, piſſentur trajectis adde farin. ſem. lini* ℥ ij, *axungiæ ſuillæ, ol. liliorum an.* ℥ ß, *fiat cataplaſma*: Or R, *malvæ, biſmalv. violar. an. m. i. caricarum ping. n. xx. paſſul.* ℥ ij, *coquantur in aq. com. tuſis, & trajectis, adde mellis com.* ℥ ij, *ung. baſilicon. & butyri recent. ana* ℥ i, *fiat cataplaſma.* You may profitably uſe for the ſame purpoſe *Empl. Diachylon magnum*, or *Baſilicon.* Or R, *Empl. Diachyl. Mag.* ℥ iij, *ung. baſilicon.* ℥ i. *ol. liliorum* ℥ ß. Of theſe mixed together make a medicine for the foreſaid uſe.

The ſigns of *pus* or matter.

When the heat, pain, feaver, and other accidents ſhall remit, when the tumor hath a ſharpe head, when by the preſſing of your finger you find the humor to flow as it were to and fro, then you may know that it is ripe.

Wherefore without any further delay the tumor muſt be opened, leſt the matter too long ſhut up, corrode the adjacent parts, and the ulcer become ſinuous and fiſtulous.

For this uſually happens, eſpecially then, when the matter is venenate or malign, or when the ſwelling is near a joint, or at the fundamennt, or ſuch like hot and moiſt places.

Hip. lib. de Fiſtula.

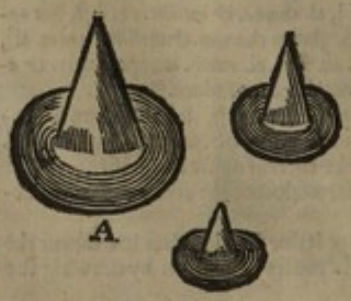
For by the decree of *Hippocrates* we ſhould anticipate the maturation of ſuch tumors by opening.

They may be opened with an inciſion knife or cauſtick, and that either actuall or potentiall. For if the Patient ſhall be heartleſs and leſs confident, ſo that he either cannot, or will not indure any inſtrument, you muſt make way for the matter by a potentiall cautery. You may alſo do the buſineſs by another ſlight, as thus.

Thruſt the point of a ſharpe knife or lancet, through a braſs counter that it may ſtand faſt in the midſt thereof; then cover it diligently with ſome Emplaiſter or Cataplaſm, that neither the Patient nor ſtanders by perceive the deceit: then laying on the plaiſter as that you would make a paſſage for the matter by that means, but when you have fitted the point to the part, where it is fit to open the tumor, ſo guide the Counter with your fingers, that you may preſently make an impreſſion into the Tumor, ſufficient for excluding the matter. I have here expreſſed three delineations of ſuch Inſtruments that you may uſe theſe, either bigger, leſſer or indifferent, as occaſion ſhall ſerve.

Counters with the points of Knives or Launces put through them.

B



A

A. ſhews the Counter or peece of Silver.
B. ſhews the point of the Lancet.

But there are ſeven things which muſt be diligently conſidered in opening all ſorts of Impoſtumes. The firſt is, that you put your knife to that part of the Abſceſs which is the ſofter, and yeelds to the impreſſion of your fingers, and where it riſes into a head, or point.

point. The ſecond is, that you make choiſe of that place for diſſection which is the loweſt, that ſo the contained impuritie may the more readily flow out, and not ſtay in the paſſage. The third is, that it be made according to the wrincles of the skin, and the right fibers of the Muſcles lying next under the skin. The fourth is, that you turn your knife from the larger veſſels and Nerves worth ſpeaking of. The fifth is, that the matter contained in them be not evacuated too abundantly at once in great Abſceſſes, leſt thereby the ſtrength be dejected, the ſpirits being much waſted together with the unprofitable humor. The ſixth is, that the affected part be handled as gently as you can. The ſeventh is, that after the opening when the matter is evacuated, the Abſceſs be cleanſed, filled with fleſh, and laſtly, conſolidated and cicatrized. But ſeeing that commonly after ſuch ſections ſome part of the Tumor remains, all the contained humor being not wholly ſuppurated, the Chirurgeon may perceive that this is an implicite affect, that is, a Tumor and Ulcer. But the Cure thereof muſt be ſo, that you take away the Tumor before the Ulcer; for the Ulcer cannot be healed before the part be reſtored to its nature. Therefore the ſuppuratives formerly preſcribed muſt be uſed, and the Ulcer muſt be dreſſed for two or three dayes with this following Medicine.

What the cure muſt be after the opening of the abſceſs.

℞ *Vitellum unius ovi, terebinth. Venet. & ol. Roſar. an.* ℥ ß, *fiat medicamentum.* Then you muſt ſeek to cleanſe it by this following Medicine.

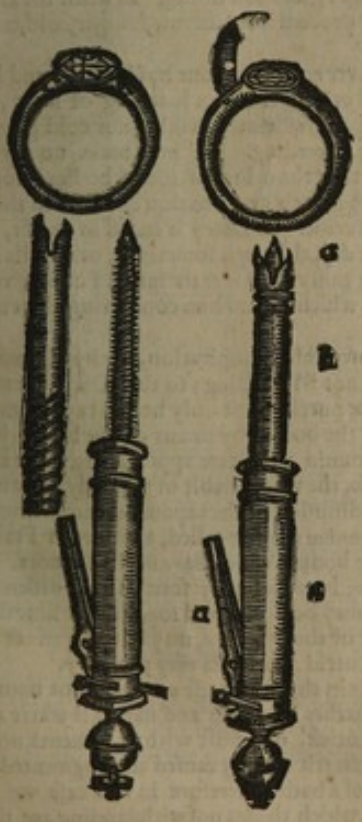
Deterſive Medicines.

℞ *Mellis roſar.* ℥ i, *Syrupi roſar. & tereb. Venet. an.* ℥ i ß, *far. hordei* ℥ ij, *fiat medicamentum ad uſum.* For this very purpoſe there is a ſingular Deterſive made of *Appium* or Smallage of which this is the deſcription.

Vnguentum de Appio.

℞ *Succi appii, plantag. beton. an.* ℥ i, *Mellis commun.* ℥ v, *terebint. Venet.* ℥ iiij, *farin. Hordei & Orobi, an.* ℥ ij, *pulveris Aloes, rad. Ireos florent. myrrhæ, an.* ℥ i, *coquatur mel. cum ſuccis quibus conſumptis addantur farinæ & pulveres, & miſceantur omnia ad formam unguenti.* But if you would cleanſe it more powerfully, you may uſe *Vnguentum Apoſtolorum*, or *Vnguentum Aureum* and *Ægyptiacum* mixed according to the ſcope you conceive in your minds; when the Ulcer ſhall ſeem ſufficiently cleanſed, it ſhall be filled with fleſh and cicatrized after the manner we ſhall declare in the proper treatiſe of the cure of Ulcers.

Other Inſtruments for opening Abſceſſes.



Rings in which little knives lye hid, fit for to open Abſceſſes.

The Delineation of a Trunke or hollow Inſtrument going with a ſpring.

A. Shews the thicker pipe.
B. Shews another which enters and is faſtened in the other by a ſcrue.
C. The point of the Inſtrument looking out.
D. The ſpring which forces the Inſtrument.

CHAP.

CHAP. XI.

Of feavers, and the cures of these feavers which accompany Phlegmons.

The Feaver of a Phlegmon. What a Feaver is.

AMongst the *Symptoms* which most usually accompany Phlegmons, and afflict all the body of the patient, Feavers are the chief; that is, hot, and dry distempers kindled in the heart, and thence by the Artery is sent over all the body; yet these which usually follow this kind of Tumors are *Ephemera*, that is, Diary, unputrid *Synochi*; Of whose nature and order of cure I will here briefly relate what I have learnt from my Masters, that is, Doctors of Physick, as I have been conversant with them in the practise of my Art.

What an *Ephemera*, or Diary is.

The *Ephemera*, or Diary [that is, of one day] is a hot and dry distemperature kindled in the vitall spirits. It hath that name, because by its own nature it tarries not above the space of one day or twenty four houres, by reason it is kindled in a subtile easily dissipable matter.

The causes thereof.

The efficient causes of this Feaver are wearines, hunger, and drunkennes, anger, fury, sorrow, watching, great & piercing cold, Adustion, Bathes, and manner of living inclining more to heat then ordinary, applying, using or drinking of acrid medicines, as Poysons, or of hot meats, or drinks; to conclude, all the efficient causes common to all Feavers, putrefaction only excepted which properly appertains to putrid feavers.

Aphorism. 55. *lib.* 4.

For a *Bubo* also, which is a *Phlegmon* of the Glandules, causes a Diary, as *Hippocrates* shews. All feavers proceeding from the Tumors of the Glandules are evill, the Diary excepted. Which *Aphorism* must be understood warily and with that distinction which *Galen* gives in his commentary, where he saith; It is only to be understood of Tumors rising in the Glandules without occasion, that is, without any evident and manifest cause; for otherwise Feavers that thence take their originall, though not Diary, yet are not all evill, as we learn by Buboes in Children, and the venereous Buboes, which happen without inflammation, or corruption of the liver; for such commonly have no malign Feaver accompanying them, which thing is worthy a Chirurgeons observation.

The signs of a Diary.

The common signs of a Diary are, a moderate and vaporous heat feeling gentle to the hand, a pulse swift and frequent, sometimes great and strong, as when the Diary is caused by anger; sometimes little, if the Feaver proceed from sorrow, hunger, cold, crudity; for other respects equall and ordinary.

Why in a Diary the urines like to these in health.

The most certain signs are, if the Feaver come upon one not by little and little but sodainly and that from some externall and evident cause, no loathing of meat, no causeles wearines, no deep sleep, yawning, great pain, restlesnes, shaking nor cold going before, and lastly, no other troublesome symptome preceding. We here make no mention of the urine, because most frequently they resemble the urines of sound bodies; for in so short a time as Diaries endure, there cannot so great a perturbation be raised in the bloud that there may be signes thereof found in the urine. A Diary is ended in one fit, which by the proper nature of this Feaver lasts but one day, although sometimes, otherwise it is extended to three, or four dayes space; and then it easily degenerates into a Putrid, especially any error of the Patient, Physitian, or those which attend him concurring therewith, or if the externall things be not rightly fitted.

The unputrid *Synochus*.

This Feaver is terminated either by insensible transpiration, or by the moisture of the skin, or by a sweat naturall, gentle, and not ill smelling; to this Diary we may refer the unputrid *Synochus* generated of bloud not putrid, but only heated beyond measure. For usually there arises a great heat over all the body, by means of the bloud immoderately heated; whence the veins become more tumid, the face appears fiery, the Eyes red and burning, the breath hot, and to conclude, the whole habit of the body more full, by reason of that ebullition of the bloud, and the diffusion of the vapours thence arising over all the body: Whence it is, that this kind of *Synochus* may be called, a vaporous Feaver. To this Children are incident as also all sanguine bodies, which have no ill humors. The cure of this and the *Ephemera* or Diary is the same; because it may scarse seem different from the *Ephemera* in any other thing, than that it may be prolonged for three or four dayes. Wherefore whatsoever we shall say for the cure of the *Ephemera*, may be applyed to the *Synochus*, bloud-letting excepted, which in an unputrid *Synochus* is very necessary.

The cure of a Diary Feaver.

Now the cure of a Diary Feaver consists in the decent use of things not natural, contrary to the cause of the disease; wherefore bathes of warm and naturall water are very profitable; so that the Patient be not Plethorick, nor stuft with excrements, nor obnoxious to catarrhes and defluxions, because a catarrh is easily caused and augmented by the humors diffused and dissolved by the heat of a bath; therefore in this case we must eschew frictions, and anointing with warm oil, which things notwithstanding are thought very usefull in these kinds of Feavers, especially when they have their originall from extreme labour, by astriction of the skin or a *Bubo*. Let this be a generall rule, that to every cause, whence this Feaver proceeded, you oppose the contrary for a remedy; as to labour, rest; to watching, sleep; to anger and sorrow, gratefull society of friends, and all things repleni-

shed

plenished with pleasant good will; and to a *Bubo*, the proper cure thereof.

Wine moderately tempered with water according to the custome of the sick patient, is good and profitable in all causes of this Feaver, except he be pained in his head, or that the Feaver drew its originall from anger, or a *Bubo*; for in this last case especially, the patient must abstain wholly from wine, untill the inflammation come to the state, and begins to decline. This kind of Feaver often troubles infants; and then you must prescribe such medicines to their Nurses, as if they were sick, that so by this means their milk may become medicinable. Also it will be good to put the Infant himself into a bath of naturall and warm water, and presently after the bath to anoint the ridge of the back and breſt with oyl of Violets. But if a *Phlegmon* possess any inward part, or otherwise by its nature be great, or seated near any principall Bowel, so that it may continually send from it either a putrid matter or exhalation to the heart, and not only affect it by a quality or preternaturall heat by the continuity of the parts, thence will arise the putrid *Synochus*, if the blood by contagion of putrefying in the greater vessels, consists of one equall mixture of the four humors. This Feaver is thus chiefly known, it hath no exacerbations, or remissions, but much less intermissions; it is extended beyond the space of twenty four houres, neither doth it then end in vomit, sweat, moisture, or by little and little by insensible transpiration; after the manner of intermitting Feavers, or Agues; but remains constant, untill it leaves the patient for altogether; it commonly happens not unless to these of a good temper and complexion, which abound with much bloud, and that tempered by an equall mixture of the four humors. It commonly indures not long, because the blood by some peculiar putrefaction degenerating into choler or Melancholy, will presently bring forth another kind of Feaver, to wit, a Tertian or continued Quartain.

The use of wine in a Diary.

How a putrid *Synochus* is caused.

The cure of this Feaver (as I have heard of most learned Physitians) chiefly consists in bloodletting. For by letting of blood the fulness is diminished, and therefore the obstruction is taken away, and lastly, the putrefaction. And seeing that in this kind of Feaver there is not only a fault of the matter, by the putrefaction of the blood, but also of the Temper by excess of heat; certainly Phlebotomy helps not only, as we said, the putrefaction, but also the hot distemper. For the blood in which all the heat of the creature is contained, whilst it is taken away, the acrid and fuliginous excrements exhale and vanish away with it, which kept in, encreased the Feaverish heat. Moreover, the veins, to shun emptiness, which nature abhors, are filled with much cold air in stead of the hot blood which was drawn away, which follows a cooling of the habit of the whole body; yea and many by means of Phlebotomy have their bellies loosed, and sweat, both which are much to be desired in this kind of Feaver.

Phlebotomy necessary in a putrid *Synochus*.

This moved the ancient Physitians, to write, that we must draw blood in this disease, even to the fainting of the Patient.

What benefit we may reap by drawing blood even to fainting.

Yet because thus, not a few have poured out their lives together with their blood, it will be better and safer to divide the evacuations, and draw so much blood at severall times, as the greatness of the disease shall require, and the strength of the Patient may bear.

When you have drawn blood, forthwith inject an emollient and refrigerative clyster; lest that the veins emptied by Phlebotomy may draw into them the impurity of the Guts; but these clysters which cool too much, rather bind the belly, than loose it. The following day the Morbifick matter must be partly evacuated by a gentle purge, as a bole of *Cassia*, or *Catholicon*; then must you appoint Syrups which have not only a refrigerative quality, but also to resist putrefaction, such as the Syrup of Lemmons, Berberries, of the Juice of Citrons, of Pomgranats, Sorrell and Vineger; let his diet be absolutely cooling and humecting, and also slender; for the native heat much debilitated by drawing of a great quantity of blood cannot equall a full diet. Therefore it shall suffice to feed the Patient with chicken and veal broths made with cooling herbs, as Sorrell, Lettuce, and Purslain. Let his drink be Barly water, Syrup of Violets mixed with some pretty quantity of boiled water, *Julepum Alexandrinum*, especially if he be troubled with scouring, or laske. But the Physitian must chiefly have regard to the fourth day, for if then there appear any signs of concoction in the excrements, the *Crisis* must be expected on the eventh day, and that either by a loosness of the belly, or an aboundance of urine, by vomits, sweats, or bleeding. Therefore we must then do nothing but commit the whole business to nature.

Why we must give a clyster presently after blood letting.

What Syrups profitable in this case.

Why a slender Diet must be used after letting much blood.

But for drinking cold water, which is so much commended by *Galen* in this kind of Feaver, it is not to be suffered before there appear signs of concoction; moreover in the declining of the disease the use of wine will not be unprofitable to help forwards sweats.

When drinking of water is to be permitted in a putrid *Synochus*.

CHAP. XII.

Of an Eryſipelas, *or Inflammation.*

The definition of an *Eryſipelas.*

HAving declared the cure of a Phlegmon, cauſed by laudable blood, we muſt now treat of theſe tumors which acknowledg choler the materiall cauſe of their generation, by reaſon of that affinity which intercedes between Choler and Blood. Therefore the tumors cauſed by naturall Choler, are called *Eryſipelata*, or Inflammations; theſe contain a great heat in them, which chiefly poſſeſſes the skin, as alſo oftentimes ſome portion of the fleſh lying under it. For they are made by moſt thin and ſubtle blood (which upon any occaſion of inflammation eaſily becomes cholerick) or by blood and choler, hotter than is requiſit, and ſometimes of choler mixed with an acrid ſerous humor.

Gal. Cap. 2. lib. 14. Meth. med. & 2. ad Glau.

That which is made by ſincere and pure choler, is called by *Galen*, a true and perfect *Eryſipelas*. But there ariſe three differences of *Eryſipelaes* by the admixture of choler with the three other kinds of humors. For if it being predominant be mixed with blood, it ſhall be termed *Eryſipelas Phlegmonodes*; if with Phlegm, *Eryſipelas œdematodes*; if with Melancholy, *Eryſipelas Scirrhodes*. So that the former and ſubſtantive word ſhews the humor bearing dominion, but the latter or adjective that which is inferior in mixture. But if they concur in equall quantity, there will be thereupon made *Eryſipelas Phlegmone*, *Eryſipelas œdema*, *Eryſipelas ſcirrhus*.

Two kinds of *Eryſipelas.*

Galen acknowledges two kinds of *Eryſipelaes*, one ſimple and without an ulcer, the other ulcerated. For choler drawn & ſevered from the warmnes of the blood, running by its ſubtlety and acrimony unto the skin, ulcerates it; but reſtrained by the gentle heat of the blood, as a bridle, it is hindered from piercing to the top of the skin, and makes a tumor without an ulcer. But of unnaturall choler are cauſed many other kinds of cholerick tumors, as the *Herpes exedens*, and *Miliaris*, and laſtly, all ſorts of tumors which come between the *Herpes* and *Cancer*. You may know *Eryſipelaes* chiefly by three ſigns, as by their colour, which is a yellowiſh red; by their quick ſliding back into the body at the leaſt compreſſion of the skin (the cauſe of which is the ſubtlety of the humor and the outward ſite of it under the skin, whereupon by ſome an *Eryſipelas* is called a Diſeaſe of the skin;) Laſtly, by the number of the Symptoms, as heat, pulſation, pain. The heat of an *Eryſipelas* is far greater than that of a Phlegmon, but the pulſation is much les; for as the heat of the blood is not ſo great, as that of choler, ſo it far exceeds choler in quantity and thickneſs, which may cauſe compreſſion and obſtruction of the adjacent muſcle.

Gal. lib. 2. ad Glauc.

For Choler eaſily diſſipable by reaſon of its ſubtlety quickly vaniſhes, neither doth it ſuffer it ſelf to be long contained in the empty ſpaces between the muſcles; neither doth an *Eryſipelas* agree with a Phlegmon in the propriety of the pain. For that of an *Eryſipelas* is pricking and biting without tenſion, or heavineſs, yet the primitive, antecedent and conjunct cauſes are alike of both the tumors. Although an *Eryſipelas* may be incident to all parts, yet principally it aſſails the face, by reaſon of the rarity of the skin of that place, and the lightneſs of the cholerick humor flying upwards. It is ill when an *Eryſipelas* comes upon a wound, or ulcer, and although it may come to ſuppuration, yet it is not good; for it ſhews that there is obſtruction by the admixture of a groſs humor, whence there is ſome danger of eroſion in the parts next under the skin.

Hip. Aph. 79. Sect. 7. Aph. 25. Sect. 16. Aph. 43. Sect. 3.

It is good when an *Eryſipelas* comes from within outwards; but ill when from without it retires inward. But if an *Eryſipelas* poſſeſs the womb it is deadly, and in like manner if it ſpread too far over the face, by reaſon of the ſympathy of the membranes of the brain.

CHAP. XIII.

Of the cure of an Eryſipelas.

Gal. 14. Method.

FOr the cure of an *Eryſipelas* we muſt procure two things, to wit, evacuation and refrigeration. But becauſe there is more need of cooling, than in a Phlegmon, the chief ſcope muſt be for refrigeration. Which being done, the contained matter muſt be taken away and evacuated with moderately reſolving medicines. We muſt do four things to attain unto theſe forementioned ends.

4 Things to be performed in curing an *Eryſipelas.*

Firſt of all we muſt appoint a convenient manner of Diet, in the uſe of the ſix things not naturall; that is, we muſt incraſſate, refrigerate and moiſten as much as the nature of the diſeaſe and patient will ſuffer, much more than in a Phlegmon; then we will evacuate the Antecedent matter, by opening a vein, and by medicines purging choler. And that by cutting the Cephalick vein, if there be a portion of the blood mixed with Choler, if the *Eryſipelas* poſſeſs the face, and if it be ſpread much over it.

In what *Eryſipelas* it is convenient to let blood, in what not.

But if it ſhall invade another part, although it ſhall proceed of pure choler, Phlebotomy will

will not be so necessary, because the bloud which is as a bridle to the choler being taken away, there may be danger, lest it become more fierce; yet if the body be plethorick, it will be expedient to let bloud, because this, as *Galen* teacheth, is oft times the cause of an *Erysipelas*. It wil be expedient to give a clyster of refrigerating and humecting things before you open a vein; but it belongs to a learned and prudent Physitian to prescribe medicines, purging choler.

The third care must be taken for Topick, or locall medicines, which in the beginning and encrease must be cold and moist, without any either dryness or astriction, because the more acrid matter by use of astringent things being driven in, would ulcerate and fret the adjacent particle.

What topick medicines are fit to be used in the beginning of an *Erysipelas*.

Galen and *Avicen* much commend this kind of remedy; Take fair water ℥vi, of the sharpest Vinegar ℥ i, make an Oxycrate, in which you may wet linnen clothes and apply to the affected part and the circumjacent places, and renew them often. Or ℞, *Succi solani, plantag. & sempervivi, an.* ℥ ij, *aceti* ℥ ß, *Mucaginis sem. Psylii* ℥ ij, *succi hyoscyami* ℥ i, *Misce.* But if the *Erysipelas* be upon the face, you must use the medicine following.

℞, *Unguent. Ros.* ℥ iiij, *succi plantagin. & sempervivi, an.* ℥ i, *trochisc. de Camphora* ʒ ß, *aceti parum*; let them be mixed together and make a liniment. But if the heat and pain be intolerable, we must come to narcotick medicines. As ℞, *succi hyoscyami, solani, cicutæ, an.* ℥ i, *album. ovorum n.* ii, *aceti* ℥ ß, *opii & Camphor. an. gra.* 4, *croci* ℈ ß, *Mucaginis sem. psyll. & fenigr. extractæ in aq. ros. & plantag. an.* ℥ i, *ol. de papav.* ℥ ij. *fiat linimentum, addendo ung. refrigerantis Gal. camphor. q. satis sit.* Yet we must not use such like medicines too long, lest they cause an extinction of the native heat and mortification of the part.

What caution must be had in the use of narcotick medicines.

Wherefore such Narcotick medicines must be used with regard of place, time and such other circumstances. Therefore we may three manner of wayes understand when to desist from using Narcotick or stupefactive medicines. The first is when the Patient in the affected part feels not so much heat, pricking and pain, as before; The second is when the part feels more gentle to the touch than before; The third when the fiery and pallid colour begins by little and little to waxe livid and black; for then must we abstain from Narcotick, and use resolving and strengthening things, whereby the part may be revived and strengthened by recalling the Native heat; As ℞, *Farinæ hordei & Orobi, an.* ℥ ij, *farinæ sem. lini* ℥ i ß, *coquantur in Hydromelite vel oxycrato, addendo pulv. rosarum & chamæmel. an* ℥ ß, *ol. anethi & chamæm. an.* ℥ i, *fiat cataplasma.* Or you may use this following fomentation, ℞, *Rad. Althææ* ℥ ij, *fol. malvæ, bismal. pariet. absinthii, salviæ, an. m.* i, *flor. chamæm. melilоti, rosar. rub. an. m.* ij, *coquantur in æquis partibus vini & aquæ, & fiat fotus cum spongia.* After the fomentation you may apply an Emplaister of *Diachylon Ireatum*, or *Diapalma* dissolved in oil of chamomile and Melilote, and such other like. The fourth Intention which is of the correction of accidents, we will perform by these means which we mentioned in curing a Phlegmon, by varying the medicaments, according to the judgment of him which undertakes the cure.

Resolving and strengthening medicines.

CHAP. XIIII.

Of the Herpes; *that is, Tetters, or Ringwormes, or such like.*

What a *Herpes* is, what be the kinds thereof. *Gal. 2. ad Glauconem.*

Herpes is a tumor caused by pure choler separated from the rest of the humors, that is carryed by its naturall lightness and tenuity even to the outer or scarse skin, and is diffused over the surface hereof. *Galen* makes three sorts of this tumor. For if perfect choler of an indifferent substance, that is, not very thick, cause this tumor, then the simple *Herpes* is generated, obtaining the name of the *Genus*; but if the humor be not so thin, but compounded with some small mixture of Phlegm, it will raise little blisters over the skin like to the seeds of Millet, whence it was that the Ancients called this Tumor the *Herpes Miliaris*. But if it have any admixture of Melancholy, it will be an *Herpes exedens*, terrible by reason of the erosion or eating into the skin and muscles lying under it.

What the *Herpes miliaris* is.

What the *exedens*.

Three intentions in curing *Herpes*.

These are absolutely three intentions of curing; The first is to appoint a Diet just like that we mentioned in the cure of an *Erysipelas*; The second is to evacuate the antecedent cause, by medicines purging the peccant humor, for which purpose oft-times clysters will suffice, especially if the patient be somewhat easie by nature, and if the urine flow according to your desire; for by this a great part of the humor may be carryed into the bladder; The third shall be to take away the conjunct cause by locall medicines ordained for the swelling and ulcer: Therefore the Chirurgeon shall have regard to two things, that is, the resolving of the tumor, and the drying up of the ulcer; for every ulcer requires drying, which can never be attained unto, unless the swelling be taken away. Therefore because the chiefest care must be to take away the Tumor, which unless it be performed there can be no hope to heal the ulcer, he shall lay this kind of medicine to dissolve and dry, as ℞ *Cerussæ & tuthiæ præpar. an.* ℥ i, *ol. ros. & adipis capon. an.* ℥ ij, *corticis pini usti, & loci,* ℥ ß, *ceræ quantum satis, fiat unguentum.* Or ℞, *Farin. hordei & lent. an.* ℥ ij, *coquantur in decocto corticis*

A rule for healing ulcers conjoyned with tumors.

mali granati, balauſt. plantag. addendo pulveris roſar. rub. abſinth. an. ℥ ß, *olei Myrtillor. & mellis com. an.* ℥ vi, *fiat unguentum, ut artis eſt.* But for an *Herpes Miliaris* theſe muſt chiefly be uſed, R, *pulv. gallarum, malicurii, balauſt. boli armeni an.* ℥ i, *aquæ roſ.* ℥ iij, *aceti acerrimi* ℥ i, *axungiæ anſer. & olei Myrtillor. an.* ℥ i ß, *terebinth.* ℥ i, *fiat unguentum ad uſum.* I have often found moſt certain help in *unguentum enulatum cum Mercurio*, for it kills the puſtules, and partly waſts the humor contained in them. Yet if the ulcer, not yet neither yeelds, but every day diffuſes it ſelf further and further, you ſhall touch the edges and lips thereof with ſome acrid medicine, as *Aqua fortis*, oyl of Vitriole, or ſuch like, for by this kind of remedy, I have oft times healed fretting ulcers, which ſeemed altogether incurable.

The force of *Unguentum enulatum cum Mercurio.* Medicines fit for reſtraining eating and ſpreading ulcers.

CHAP. XV.

Of Feavers, which happen upon Eryſipelous Tumors.

A vulgar deſcription of an intermitting Tertian feaver.

AS Feavers ſometimes happen upon Inflammations, and Eryſipelaes, which favour of the humor whereof they proceed, that is, Choler. Therefore ſeeing it is peculiar to Choler, to move every third day, it is no marvail if great Inflammations bring with them Tertian Feavers, or Agues, which have their fit every third day; for it is called an Intermitting Tertian which comes every other day.

The cauſes of Tertian feavers.

The Primitive cauſes in generall are ſtrong exerciſes, eſpecially in the hot Sun, the uſe of heating, and drying either meats or medicines, great abſtinence joyned with great labour, care, ſorrow; the antecedent cauſes are the plenty of choler in the body, an hot and dry diſtemperature either of the whole body, or of the liver only: the conjunct cauſe is the putrefaction of the cholerick humor lying in ſome plenty without the greater veſſels, in the habit of the body.

The ſigns of an intermitting Tertian.

The ſigns, a ſhaking or ſhivering like as when we have made water in a cold winter morning, a great pricking, ſtretching, or ſtiffneſs, as if there were pins thruſt into us over all our bodies, by reaſon of the acrimony of the cholerick humor driven uncertainly and violently over all the body, and the ſenſible membranous and nervous particles at the beginning of the fit; then preſently the heat becomes acrid, the Feaver kindled, like a fire in dry ſtraw; the pulſe is great, quick and equal; the tongue dry; the urine yellowiſh, red and thin. The Symptomes are watchings, thirſt, talking idlely, anger, diſquietneſs and toſſing the body at the leaſt noiſe or whiſpering. Theſe Feavers are terminated by great ſweats. They are incident to cholerick young men, ſuch as are lean, and in Summer; after the fit oft times follow cholerick vomiting and yellowiſh ſtools. After the fit there follows an abſolute intermiſſion retaining no reliques of the Feaver, untill the approach of the following fit, becauſe all the cholerick matter by the force of that fit and nature is eaſily caſt out of the body, by reaſon of its naturall levity and facility; whereas in Quotidians there is no ſuch thing, as which after the fit alwayes leave in the body a ſenſe and feeling of a certain inequality by reaſon of the ſtubborneſs of the Phlegmatick humor, and dulnes to motion. The fit commonly uſes to endure 4, 5, or 6 houres, although at ſome time it may be extended to 8 or 10. This Feaver is ended at 7 fits, and uſually is not dangerous, unleſs there be ſome error committed by the Phyſitian, Patient, or ſuch as attend him. Tertians in ſummer are ſhorter, in winter longer.

The Symptomes

Why Tertians have an abſolute ceſſation of the feaver at the end of each fit.

Wherefore the beginning of the fit is accompanied with ſtifneſs, or ſtretching, the ſtate with ſweat, whereupon if the noſe, lips or mouth break forth into pimples or ſcabs, it is a ſign of the end of the Feaver, and of the power of nature which is able to drive the conjunct cauſe of the diſeaſe from the center to the habit of the body; yet theſe pimples appear not in the declining of all Tertians, but only then, when the cholerick humor cauſing the Feaver ſhall reſide in the ſtomach, or is driven thither from ſome other part of the firſt region of the Liver. For hence the ſubtler portion thereof carryed by the continuation of the inner coat to the mouth and noſe, by its acrimony eaſily cauſes pimples in theſe places. The cure is performed by Diet, and Pharmacy.

The diet of ſuch as have a Tertian.

Therefore let the Diet be ſo ordered for the ſix things not naturall, that it may incline to refrigeration and humection, as much as the digeſtive faculty will permit, as Lettuce, Sorrel, Gourds, Cowcumbers, Mallows, Barly Creams, Wine much allaid with water, thin, ſmall, and that ſparingly and not before ſigns of concoction ſhall appear in the urine; for at the beginning he may not uſe wine, nor in the declining, but with theſe conditions, which we have preſcribed.

When ſuch as have a tertian may uſe wine.

The time of feeding the patient.

But for the time of feeding the patient, on that day the fit is expected, he muſt eat nothing for three houres before the fit, leſt the aguiſh heat lighting on ſuch meats as yet crude, may corrupt and putrefie them; whence the matter of the Feaver may be increaſed, (becauſe it is as proper to that heat to corrupt all things, as to the native to preſerve and vindicate from putrefaction) the fit lengthened, and nature called away from the concoction and excretion of the Morbifick humor; yet we may temper the ſeverity of this law by having regard to the ſtrength of the patient; for it will be convenient to feed a weak patient not only before the fit, but alſo in the fit it ſelf, but that only ſparingly, leſt the ſtrength ſhould be too much impaired.

Now

Now for Pharmacy; It muſt be conſidered, whether the ſtrength of the Patient be ſufficient, if the humors abound; for then you may preſcribe *Diaprunum ſimplex*, *Caſſia* newly extracted, the decoction of Violets, of Citrin Myrobalanes; Syrups of Violets, Roſes, of Pomegranats and Vineger. But if the powers of the Patient languiſh, he muſt not only not be purged, but alſo muſt not draw blood too plenteouſly, becauſe Cholerick men ſoon faint, by reaſon of the facile and eaſie diſſipation of the ſubtle humors and ſpirits; beſides ſuch as are ſubject to tertian Feavers do not commonly abound with blood, unleſs it be with Cholerick bloud, which muſt rather be renued, or amended by cooling and humecting things, than evacuated. Yea verily, when it is both commodious and neceſſary to evacuate the body, it may bee attempted with far more ſafety by ſuch things as work by inſenſible tranſpiration, which provoke ſweats, vomit or urine by reaſon of the ſubtlety of the Cholerick humor, than by any other. Alſo the frequent uſe of emollient glyſters made with a decoction of Prunes, Jujubes, Violets, Bran and Barley, will profit much. If the Patient fall into a *Delirium* or talk idlely by reaſon of the heat and dryneſs of the head, with a particular exceſs of the cholerick humor, the Head muſt be cooled by applying to the Temples and Forehead and putting into the Noſe oyl of Violets, Roſes, or womans milk. Let the feet and legs be bathed in fair and warm water, and the ſoles of the feet be anointed with oyl of Violets and ſuch like. When to purge the patient.

In the declining, a Bath made of the branches of Vines, the leaves of Willowes, Lettuce and other refrigerating things boiled in fair water, may be profitably uſed three houres after meat eaten ſparingly.

But I would have you ſo to underſtand the Declination or declining not of one particular fit, but of the diſeaſe in generall, that the humors already concocted, allured to the skin by the warmneſs of the bath, may more eaſily and readily breath forth: he which otherwiſe ordains a bath at the beginning of the diſeaſe, will cauſe a conſtipation in the ſkin and habit of the body, by drawing thither the humors peradventure tough and groſs, no evacuation going before. When the time is fit to uſe a Bath.

Alſo it will be good after generall purgations to cauſe ſweat by drinking White wine thin and well tempered with water; but urine by a decoction of Smallage and Dill; Certainly ſweat is very laudable in every putrid Feaver, becauſe it evacuates the conjunct matter of the diſeaſe, but chiefly in a Tertian, by reaſon that choler by its inbred levity eaſily takes that way, and by its ſubtility is eaſily reſolved into ſweat. But that the ſweat may be laudable it is fit it be upon a critical day, and be foreſhewed by ſigns of concoction agreeable to the time and manner of the diſeaſe. Sweats when as they flow more ſlowly are forwarded by things taken inwardly and applied outwardly; by things taken inwardly, as with white wine, with a decoction of Figs, Raiſins ſtoned, graſſe roots and the like opening things; but by things outwardly applied, and ſpunges dipped in a decoction of hot herbs (as Roſmary, Time, Lavander, Marjerom and the like) applied to the Groins, Armholes, and ridge of the back. What kinds of evacuations are moſt fit in a Tertian. Sudorificks.

You may for the ſame purpoſe, fill two Swines bladders with the ſame decoction, or elſe ſtone bottles, and put them to the feet, ſides, and between the thighes. Then let this be the bound of ſweating, when the Patient begins to waxe cold, that is, when the ſweat feels no more hot, but cold.

But by the conſent of all, bloud muſt not be letten after the third fit, but preſently at the beginning of the Feaver, according to the opinion and preſcription of *Galen*; for ſeeing this Feaver for the moſt part is terminated at ſeven fits, if you ſtay untill the third fit bee paſt, the Feaver will now be come to its ſtate; but *Hippocrates* forbids us to move any thing in the ſtate, leſt nature then buſied in concocting the diſeaſe, be called from its begun enterpriſe. When blood muſt be let. *Aphor. 29. Sect. 2.*

CHAP. XVI.

Of an Oedema *or cold Phlegmatick Tumor.*

HItherto we have treated of hot Tumors, now we muſt ſpeak of cold; Cold Tumors are only two, an *Oedema* and a *Scirrhus*; And for all that *Hippocrates* and the Ancients uſed the word *Oedema* for all ſorts of Tumor, in generall; yet by *Galen* and theſe Phyſitians, which ſucceeded him, it hath been drawn from that large and general ſignification, to a more ſtrait and ſpeciall, only to deſign a certain *ſpecies*, or kind of Tumor. *Gal. lib. de tumid. præter natur.*

Wherefore an *Oedema* is a ſoft, laxe and painleſſe Tumor, cauſed by collection of a Phlegmatick humor. What an *Oedema* it.

The Ancients made eight differences of Tumors proceeding of Phlegm: The firſt they termed a true and lawfull *Oedema* proceeding from naturall Phlegm; from unnaturall phlegm by admixtion of another humor they would have three ſorts of Tumors to ariſe, as The differences of *Oedema*.

that by mixture of blood, ſhould be made an *Oedema Phlegmonode s*, and ſo of the reſt.

Beſides, when they perceived unnaturall Phlegm either puffed up by flatulency, or to flow with a wateriſh moiſture, they called ſome *Oedemaes* flatulent, others wateriſh; but alſo when they ſaw this ſame Phlegm often to turn into a certain Plaiſter-like ſubſtance, they thought that hence proceeded another kind of *Oedema*, which they expreſſed one while by the name of *Atheroma*, another while by *Steatoma*, and ſometimes by *Melicerides*, as laſtly, they called that kind of *Oedema* which is cauſed by putrid and corrupt flegm, *Scrophule*. For we muſt obſerve that Phlegm ſometimes is naturall, and offends only in quantity, whence the true *Oedema* proceeds; otherwhiles it is not naturall; and it becomes not naturall, either by admixtion of a ſtrange ſubſtance, as bloud, Choler or Melancholy, whence ariſe the three kinds of *Oedema's* noted formerly by the way; or by the putridneſs and corruptions of its proper ſubſtance, whence the *Struma* and *Scrophule* proceed; or by concretion, whence kernels and all kinds of Wens, *Ganglia* and knots; or by reſolution, whence all flatulent and wateriſh Tumors, as the *Hydrocele*, *Pneumatocele* and all kinds of Dropſies.

By how many waies Phlegm becomes not naturall.

The Cauſes.

The cauſes of all *Oedema's* are the defluxion of a Phlegmatick or flatulent humor into any part, or the congeſtion of the ſame made by little and little in any part, by reaſon of the imbecillity thereof in concocting the nouriſhment, and expelling the excrement.

The ſigns.

The ſigns are a colour whitiſh and like unto the skin, a ſoft Tumor, rare and laxe by reaſon of the plentifull moiſture with which it abounds, and without pain, by reaſon this humor infers no ſenſe of heat nor manifeſt cold; when you preſs it with your finger the print thereof remains, becauſe of the groſſneſs of the humor and ſlowneſs to motion.

The prognoſticks.

Oedema's breed rather in winter than in ſummer, becauſe winter is fitter to heap up Phlegm; they chiefly poſſeſs the Nervous and Glandulous parts, becauſe they are bloudleſs, and ſo cold and more fit by reaſon of their looſneſs to receive a defluxion; for the ſame cauſe bodies full of ill humors, ancient, and not exerciſed, are chiefly troubled with this kind of Tumor.

How *Oedema's* are terminated.

An *Oedema* is terminated ſometimes by reſolution, but oftner by concretion, ſeldomer by ſuppuration, by reaſon of the ſmall quantity of heat in that humor.

A Symptomaticall *Oedema*, as that which follows upon a Dropſie or Conſumption, admits no cure unleſs the diſeaſe be firſt taken away.

The intentions of curing *Oedema's*.

The generall cure is placed in two things, that is, in evacuation of the conjunct matter prohibiting the generation of the antecedent. We attaine to both chiefly by four means.

The diet.

The firſt truly by ordaining a fit manner of living and preſcribing moderation in the uſe of the ſix things not naturall. Wherefore we muſt make choiſe of ſuch air as is hot, dry and ſubtile; we muſt preſcribe wine of a middle nature for his drink; let the bread be well baked; let meats be appointed which may generate good bloud, and theſe rather roſted than boyled. Let all fruits be forbidden, as alſo broths and milk-meats; let him eat ſuch fiſh as are taken in ſtony rivers; the Patient ſhall obſerve mediocrity in feeding, but principally ſobriety in drinking, for fear of crudities; after meat let him uſe digeſtive powders, or common drige powder; if his belly be not naturally looſe, let it be made ſo by art.

Exerciſe.

Let the Patient uſe exerciſe before meat, ſo by little and little to ſpend this humor, and reſtore the native heat. Let him ſleep little, becauſe much ſleep breedeth cold humors; let him avoid grief and ſadneſs. And if he be of a weak body, let him abſtain from venery, leſt by another weakning by the uſe of venery added to his preſent infirmity, he fall into an uncurable coldneſs, from whence a greater meaſure of crudity will ariſe. Otherwiſe, if the body be ſtrong and luſty, by ſuch exerciſes and the moderate uſe of venery it will be the more dryed and heated.

What to be obſerved in the uſe of venery. *6. Epid. ſect. 5. ſen. 23.*

For ſo that ſentence of *Hippocrates* is to be underſtood; That venery is a cure for Phlegmatick diſeaſes, as *Galen* in his commentaries tels us. The Phyſitian may perform the ſecond intention by turning his counſell to that part, from whence the ſpring of this Phlegmatick humor flows. For if the infirmity ariſe from the ſtomach, or from any other part, the part from whence it comes muſt be ſtrengthened; if from the whole habit of the body, let attenuating, penetrating and opening medicines be preſcribed. We perform the third intention by evacuating the humor impact in the part with locall medicines varied according to the four times of the Tumor.

Lib. 2 ad Glauc. cap. 3.
A rowler.

For *Galen* in the beginning and encreaſe preſcribeth a fomentation of *Oxycraton* uſed with a ſponge. But if ſo be that the *Oedema* be upon the Arm or Leg, a repelling rowler is very good, that is, ſuch an one as is brought from below upwards. So theſe medicines following are very fit for the ſame purpoſe, ℞, *Lixivii ex cineribus ſarmentorum, & caulium, an.* ℥ iiij, *Tartari & Aluminis an.* ℥ ß, *aceti* ℥ ij, mixe all together and make a decoction, wherein wet ſponges and foment the place. Alſo you may uſe the following Cataplaſm, ℞, *farinæ hordei* ℥ iiij, *coquantur in Lixivio communi, addendo pulveris nucis cupreſſi, corticum granatorum, balauſti. an.* ℥ i, *Myrrhæ, Aloes, alum. an.* ℥ ß, *olei Myrtill.* ℥ ij, *fiat Cataplaſma.* In the ſtate and declination you muſt uſe drying and reſolving medicines, as ℞, *Nucum cupreſſi, granat. ſumach. balauſti, an.* ℥ i, *Salviæ, origan. calament. Hyſſopi, meliſſæ an. m.* i, *abſinthii, plantag. caudæ equ. tapſi. barb. centinod. an. m. ſſ. alum. tartar. & ſalis com. an.* ℥ i, *coquantur cum lixivio*; foment it with a ſponge, then preſently apply this following Cataplaſm. ℞, *Rad. Brioniæ*

Brioniæ ℥ ij, *abſinth. plantag. centin. chamæm. melilоti, peleg. an. m. ſſ. coquantur in hydromelite, piſtentur, trajiciantur, addendo pulveris roſ. rub. chamem. melil. an* ℥ i, *fiat Cataplaſma.*

Laſtly, you may here with good ſucceſs uſe reſolving emplaiſters and ointments, firſt, heating or chafing the part by friction or fomentations, as well moiſt as dry; otherwiſe emplaiſters will ſcarſly do their duty, by reaſon of the great coldneſs of the part, being not ſufficient of it ſelf to aſſimilate the nouriſhment, or to expell the ſuperfluous and unprofitable humor. Let a fomentation be made with white Wine, in which Sage, Roſemary, Time, Lavander, Chamomile and Melilote flowers, red Roſes, Orris roots, *Staechas* and ſuch like have been boyled, with a little Vinegar added thereunto. Quench hot bricks in the ſame decoction, and apply them wrapped in linnen clothes to the affected part, for ſo a vapour will breath forth which hath an attenuating, piercing, reſolving and ſtrengthening faculty. But you may in ſtead of the bricks fitly apply Hogs or Oxe bladders, filled half full with the foreſaid decoction, and that hot. The frictions muſt be made of hot linnen clothes, for ſo the native heat together with the bloud and ſpirits is recalled to the part, and fuliginous humors contained under the skin are reſolved, whereby the ſtrength of the part is in ſome part recovered.

What caution to be had in application of Emplaiſters.

CHAP. XVII.

Of the cure of flatulent and wateriſh Tumors.

IFormerly declared that not only flatulent and wateriſh Tumors were comprehended under this word *Oedema*, but alſo ſuch as are bred of congealed Phlegm, as *Atheromata*, *Steatomata* and *Melicerides*. Flatulent or windy Tumors are cauſed by vapour and wind kept in or contained ſometimes under the skin, ſomewhiles under the membranes, as the *Periоſteum* and *Pericranium*, whereupon inſues cruell torment by reaſon of the diſtention of theſe parts which are endued with moſt exquiſite ſenſe. Sometimes the Entrails, as the ſtomach and Guts are ſwollen and ſtreeched out with wind, as in a Tympany.

In what places flatulencies may be gathered.

They in this differ from a true and ligitimate *Oedema*, that when you lay your finger upon them and take it off again, there remains no ſign of the preſſure thereof, becauſe they are diſtent by vapour and not by humor, for the vapour being preſſed returns ſpeedily again, as you may perceive by balls or bladders filled with wind.

In what flatulent tumors differ from a true *Oedema*.

The cauſe of ſuch Tumors is the weakneſs of the native heat, not being able eaſily to reſolve and waſte the Phlegm by which the windy Tumors are raiſed, for ſo the morning Sun (which in ſome ſort reſembles our native heat) cannot reſolve the miſts diſperſed in the air; which at noon it eaſily reſolves into pure air. Alſo after the ſame manner our weaker heat ſtirs up vapours from that Phlegm it could not diſſolve, which vapours are the matter of inflamations, or ſwellings. But oft times although the native heat be ſufficiently powerfull, yet becauſe the humor lyeth deep, or is kept by the thickneſs of ſome membrane, tendon or Ligament, the ſtirred up vapour cannot exhale, whereby it comes to paſs, that encreaſed by little and little it cauſes a Tumor.

The cauſes of flatulent Tumors.

The ſigns of ſuch a Tumor are a certain renitency or reſiſtance perceived by preſſing it with your finger, and ſometimes a noiſe as if you ſmite upon a drum, eſpecially if much wind be contained therein, ſuch as are often gathered together in the hollowneſs of the belly, and in the ſpaces between the larger muſcles. The Tumor is neither red nor hot, but rather cold and white as in an *Oedema*. It often poſſeſſeth the joints, and eſpecially the knees, and it is very difficult to be reſolved. If ſuch flatulency be gathered together in the Guts, it cauſeth the wind Colick, in which ſometimes the diſtention is ſo great that death enſues by reaſon of the renting or tearing the coats of the Guts.

The ſigns of ſuch Tumors.

CHAP. XVIII.

Of the cure of a flatulent and wateriſh Tumor.

WE ſhall chiefly and principally cure flatulent and wateriſh tumors by three means. Firſt, by the ſame diet which we preſcribed in an *Oedema*; then by ſtrengthening the parts appointed for concoction, as the ſtomach and Liver, chiefly by the temperate uſe of Aromatick things, as *Diacuminum*, *Diacalamentha*, *Aromaticum*, *Caryophyllatum*, *Aromaticum Roſatum*, and the like, to be preſcribed according to good liking of the Phyſitian which overſees the cure; laſtly, by taking away of the conjunct matter by hot, drying and attenuating medicines which they call Carminative, that ſo the part being rarified the humor and flatulency therein contained may be diſcuſſed and diſſipated. But remedies of this nature muſt be varied according to the variety of the parts; for ſome things are fit to be applyed to the ſtomach, others to the Guts, others to the joints, and others to the fleſhy parts; for the Colick you muſt inject carminative glyſters, let reſolving *Sacculi* or Bags be applied, and cupping-glaſſes faſtened to the Navel; if an outward part be affected

Diet. Things ſtrengthning the parts.

Medicines evacuating the conjunct matter.

affected,we uſe fomentations,liniments,chiefly if pain torment; as alſo Cataplaſmes and Emplaiſters,as ℞ *Florum cham.an.melil. roriſmarini, roſar. rub. an. p.j.abſinthii ji. hyſſopi,an.m.* let them be boiled in Lye,adding a little vineger for a fomentation to be uſed with ſpunges.

Galens fomentation.

Galen foments the part with Roſe-vinegar and a little ſalt put thereto, and would have a ſpunge dipped therein to lye ſomewhat long upon the part. ℞ *Olei cham.em. aneth. rut. & liliorum, an.* ℥ß, *ceræ albæ* ℥ vj. *aq. vitæ* ℥j, let them all be mixed together and make a liniment,with which anoint the part after the fomentation. ℞ *Farinæ fabar. orobi, an.* ℥iij, *coquantur in decocto pulegii, origani, calamenth. ſalviæ, addita pulverum cham.em. & melilot.an. m.* ß, *furfur. farinæ fab. & orobi, an.* ℥ij, *cequantur cum lixivio communi, addendo terebinth.* ℥iij, *oleor. aneth. & rut. an.* ℥ij.make an emplaiſter for the foreſaid uſe.

The emplaiſter of *Vigo* with Mercury,and without,is very good for the ſame purpoſe. But you muſt note, that ſuch medicines muſt be applied to the part actually hot, and the ſame heat muſt be contained and renewed by putting about it linnen clothes, bricks, bottles and ſuch like hot things.

Corroborating medicines.

The Humor and flatulency which were kept ſhut up in the part being reſolved, the part muſt be ſtrengthned,leſt now and then it receive or generate the like matter. That may be done by the following fomentation and cataplaſme.℞ *Nucum cupreſſi, corticum granat. ſumach. berberis, balauſt. an.* ℥j.*caudæ equin.arnoglo ſs.tuſſi barb. abſinth.ſalviæ, roriſm.lavendul. an. m.ſſ. flor. cham.em. melil.roſar. anthos, an.p.* j. *alum. ſalis com. an.* ℥j, *bulliant omnia in æquis partibus aquæ fabrorum & vini auſteri,*make bags for a fomentation, or uſe the decoction for the ſame purpoſe with a ſpunge.℞ *Farinæ fab. hordei & lupin. an.*℥ij.*terebinth. com.* ℥iiij. *pulver.radicis ireos, maſtic. an.* ℥ß, *mellis com.* ℥ijß, of the foreſaid decoction as much as ſhall ſuffice,ſo to make a cataplaſme to the form of a poultis liquid enough, let it be applied hot to the affected part having uſed the fomentation before.

The ſigns of a wateriſh tumor.

The ſigns of a wateriſh tumor are the ſame as of a flatulent;but over and beſides it ſhines, and at the preſſing with your fingers, there is heard a noiſe or murmur as of a bladder half filled with water.

Why a wateriſh tumor muſt be opened with an inſtrument.

Therfore the wateriſh tumor if it ſhal not yeeld to the forementioned reſolving medicines, the way muſt be opened with an inciſion knife, after the ſame manner, as we mentioned in a Phlegmon. For oftentimes this kind of remedy muſt be neceſſarily uſed,not only by reaſon of the contumacie of the humor which gives no place to the reſolving medicines, but alſo becauſe it is ſhut up in its proper ciſt or bag, the thickneſſe of which fruſtrates the force of the reſolving medicines, neither ſuffers it to penetrate into the humor. As I ſome years agoe found by experience in a maid of 7 years old;which troubled with a *Hydrocele* or wateriſh rupture,to whom when I had raſhly applyed to diſſolve it reſolving medicines of all ſorts,at length I was forc't to open it with my knife;not only to evacuate the contained matter,but alſo that I might pluck out the bag, which unleſſe it were cut up by the root, would be a meen to cauſe a relapſe. *John Altine* Doctor of Phyſick called me to this buſineſſe. *James Guilemeau* the Kings Chirurgeon overſaw the cure.

A Hiſtory.

CHAP. XIX.

Of an Atheroma, Steatoma, and Meliceris.

In what an *Atheroma, Steatoma,*and *Meliceris* differ.

ALthough theſe tumors may be thought comprehended under one *genus* with other *Oedematous* tumors, yet they differ as thus;that is, their matter is ſhut up in its bladder or bag, as it were in a peculiar cell. But their difference amongſt themſelves is thus; the matter of the *Steatoma*,as the name ſignifieth, is like unto Tallow [for στέαρ in Greek ſignifieth Tallow,or ſeam] yet it oft-times is found ſtuffed with other divers hard bodies,ſtony, bony or callous like unto the claws of an hen.For *Philoxenus* reports that he ſometimes ſaw flyes in a *Steatoma* at the opening thereof,and ſuch other like things wholly diſſenting from the common matter of Tumors. The matter contained in an *Atheroma* is like to pap,with which they feed little Children.A *Meliceris* contains matter reſembling honey in colour and conſiſtence; theſe tumors appear and riſe without any inflamation going before them.Thus you ſhal know theſe tumors;a *Steatoma* is harder than the other two, neither yeelds it to the preſſure of your finger,but when it once yeelds, it doth not ſpeedily and eaſily return to its former figure,becauſe the matter is more groſs; it is of the ſame colour as the skin, without pain,and of a longiſh figure.The *Meliceris* yeelds to the touch, as being a looſe and ſoft body, and as it is eaſily diſpoſed and diffuſed,ſo it quickly returns to its former place and tumor. It differs from the *Atheroma* in figure and ſubſtance. For it is more globous and of a ſubtiler and more ſhining matter, beſides alſo it takes up a large ſpace, and is more obſequious to the touch, and for the reſt, without pain. As for the manuall operation of the Chirurgeon in their cure, it ſeems to be of no great conſequence of what ſort the matter is,whether reſembling tallow, honey, or pap, for there is one ſimple manner of operation, which is, that you pluck away the contained humor, as alſo the receptacle in which it is contained. Yet you muſt note ſuch tumors, ſometimes as it were hanging in the ſurface of the skin, are eaſily to be moved this way,

Of Chirurgery to be uſed to theſe tumors.

and

and that way; but otherſome again deeper faſtned firmly cohere with the adjacent bodies, and theſe require an exquiſit hand and alſo induſtry for fear of a great flux of blood and convulſion by cutting a vein. There are many other kinds of tumors, as the *Teſtudo* or Mole, the *Nata*, the *Glandula*, *Nodus*, *Bothon*, *Lupia*, which as in matter (for they are all of a thick, clammy and viſcous Phlegmatick humor) ſo alſo in kind they agree with an *Atheroma*, *Steatoma*, and *Meliceris*. But alſo in theſe for the moſt part, when they are opened, you may ſee bodies of all ſorts far different from the common matter of tumors, as ſtones, chalk, ſand, coals, ſnails, ſtraws; or awneſs of corn, hey, horn, hairs, fleſh both hard and ſpongeous, griſtles, bones, whole creatures as well living as dead.

What the cauſe may be, that we ſometimes find *inſecta* in theſe Tumors.

The generation of which things (by the corruption and alteration of humors) ſhall not make us much to admire it, if we conſider, that as nature of all the ſeeds and elements of the whole great world, hath made man the Microcoſme or little world, that he might be, as it were, the lively Image of that greater world; ſo in him, it being never idle in us, would have all the kinds of all motions and actions to ſhew themſelves, as long as matter for generation is not wanting. But becauſe there is little, or rather no mention of theſe tumors amongſt the ancients, we will briefly ſhew the opinions of the later writers concerning them.

What the *Teſtudo*, or *Talpa* is.

Now they ſay, the *Teſtudo* is a tumor contrary to nature, ſoft, diffuſed, or vaulted, or arched like a Tortois, ſometimes it ariſes in the head in form of a Mole, and then it is called a Mole.

What the *Nata* is.

The *Nata* is a great and fleſhy tumor, not in ſhape unlike a Melon, or rather the fleſh of a mans buttocks, whence it may ſeem to have had the name, unleſs we had rather ſay it had it, becauſe it more uſually breeds upon the buttocks, than upon any other part of the body.

What a *Glandula*.

The *Glandula* takes its denomination from an Acorn, called *Glans* in Latine, the which it ſomewhat reſembles in the compaſſe and form of the tumor; or elſe becauſe it moſt commonly breeds in the Glandules, or Emunctories of mans body.

What *Nodus*.

The *Nodus* or knot, is a round tumor, hard and immoveable, named from a rope tied on a knot.

Guido Cauliacenſis affirms knots commonly to grow in nervous bodies; but at this time they more uſually ariſe on the bones of ſuch as have the French diſeaſe.

CHAP. XX.

Of the cure of Lupiæ, *that is, Wens, or Ganglions.*

What a Glandula is.

A Wen or *Ganglion* is a tumor ſometimes hard, ſometimes ſoft, yet alwaies round, uſing to breed in dry, hard, and nervous parts. And ſeeing that ſome of the tumors mentioned before in the former Chapter, ſtick immoveable to the part to which they grow, becauſe they are contained in no ciſt, or bag; otherſome are moved up and down by the touch of your fingers, becauſe they are contained in a bag or bladder, it commonly comes to paſſe that Wens have their bladder wherein to contain them, and therefore we think fit, the rather more freely, and particularly to treat of their cure, becauſe they are more difficultly cured, eſpecially where they are inveterate and of long ſtanding.

The cauſes.

The primitive cauſes of theſe are dull blows, fallings from high places, ſtrains, and other ſuch like occaſions. But the antecedent and conjunct cauſes are the ſame with thoſe of an *Atheroma*, *Meliceris* and *Steatoma*.

Signes.

The deſcription formerly ſet down, will furniſh you with the ſigns by which you may know when they are preſent; certainly from very ſmall beginnings they grow by little and little to a great bigneſs, in the ſpace of ſix or ſeven yeers, ſome of them yeeld much to the touch, and almoſt all of them are without pain.

Their cure at the beginning.

You may hinder ſuch as are beginning and firſt growing, from encreaſe by ſomewhat a ſtrong and frequent rubbing with your fingers. For ſo their bag or bladder, together with the skin wax thin, and the contained humor grows hot, is attenuated and reſolved. But if ſo you nothing prevail, you muſt lie upon them with your whole hand, or a flatted peece of wood as heavy as you can, untill ſuch time as the ciſt or bag be broken by your impreſſion; Then apply and ſtrongly bind unto it a plate of lead, rubbed over with Quick-ſilver; for I have many times found by experience, that it hath a wonderfull force to reſolve and waſt the ſubject humor. But if the Wen be in ſuch a place in which you can make no ſtrong impreſſion, as in the face, cheſt, belly, & throat, let there be applied an emplaiſter which hath a reſolving force, ſuch as this following hath; ℞ *gummi ammon. bdelii, galban. an.* ℥iij. *liquefiant in aceto, & trajiciantur per ſetaceum, addendo olei liliorum & lauri, an.* ℥j. *aqu. vitæ parum, pulveris ireos, ſalis ammon. ſulphur. vivi, vitrioli romani, an.* ʒß. let them be all incorporated together, and make an Emplaiſter according to Art. But if the tumor cannot be thus reſolved, it muſt be opened with a knife or cautery. And after the Eſchar is removed, and the bag waſted by Ægyptiacum, Mercury, and the like, the ulcer muſt be cleanſed, repleniſhed with fleſh, and cicatrized.

Plates of lead rubbed with Quick ſilver.

A reſolving plaiſter.

Things to waſt or conſume the bag.

Some-

Sometimes Wens grow to ſo great a maſſe, that they cannot be cured by the deſcribed remedies, wherefore they muſt be taken away by the root, by your hand and inſtrument, if ſo be that there be no danger by reaſon of their greatneſs, and ſo that they adhere not too cloſely to the adjacent parts, and if they be not too nigh to the greater veins and arteries; for it will be better in ſuch a cauſe to let them alone. This ſhall be your way to cut them off, or take them away. A ſmall inciſion muſt be made, even to the bladder, or bag, by which thruſt in a probe of a fingers thickneſs, hollowed in the midſt, round at the end, and as long as need ſhal require; then draw it many times about between the skin & the bag, even to the root of the Wen, that ſo the skin may be divided long waies, then it will be requiſite to make another inciſion overthwart, ſo that they may interſect each other like a croſs; then preſently draw the skin from the bladder, from the corners of the Wen, towards the root, and that with your finger covered with a fine linnen cloth, or elſe with a Razor if need require.

The manner to take away Wens.

But yon muſt obſerve that in a Wen there are alwaies certain veſſels, which are ſmall in the beginning, but much encreaſed in proceſſe of time, according to the encreaſe of the Wen, whereof they are as it were the roots; wherefore if any *Hæmorrhagie* or flux of bloud happen, let it be ſtopped by binding the veſſels at their heads and roots, or make a ſtrait ligature at the roots of the Wen, with a peece of whipcord, or with a many times doubled thred, and let the ends hang forth until it fall away of its own accord. Neither will it bee ſufficient to have cut away all this tumor, but alſo it will be fit to cut away a portion of the skin, wherewith the tumor was covered, and only to leave ſo much as ſhall ſuffice to cover the part, then with a needle and thred draw together the lips of the inciſion, but in the interim let tents be put into the bottome of the ulcer untill it be perfectly cleanſed, and the reſt of the cure be workmanlike performed, even to the cicatrizing thereof.

A Hiſtory.

The Chirurgeon *Collo* and I uſing this method, in the preſence of Maſter D^r. *Violanius* the Kings Phyſitian, took away a Wen from Martiall *Colard*, the Major of *Burbon*; it hanged at his neck, as big as a mans head, and it weighed eight pounds; which made it ſo troubleſome and burdenſome to him, that he was forced to carry it bound up in a towell, as in a ſcrip.

What Wens to be cured by ligature.

Verily if theſe kind of tumors have a ſlender root and broad top, they muſt be ſtraitly tied and ſo cut off.

Which dangerous to cure.

But it is very difficult and full of dangerous chance to take away ſuch Wens as are ſeated in the neck, neer unto the Jugular veins, theſe under the Arm-holes, in the groins, and ſuch as are under the ham; by reaſon of the deadly force of ſuch ſymptomes, as may thence ariſe. We can only conjecture, not certainly ſay, what kind of matter may be contained in them. We can only know of what ſort it is, when by inciſion it is preſented to our ſight. Yet in ſuch as are very hard and do much reſiſt the touch, there are often found matters, which in conſiſtence may be reſembled to little ſtones or pibles.

A Hiſtory.

I being on a time called to open the body of a great Lady, found in one of her breſts a body which might equal the bigneſs of an Hens egg, hard, and compact like a rough pible; it was held, whilſt ſhe lived, both by the Phyſitians and Chirurgeons, to be a *Cancer*, becauſe this hardneſs was very painfull to her, when it was but gently preſſed down.

The manner of a Wen is ſometimes taken for a *Cancer*.

Another Hiſtory.

But alſo ſome few yeers agon, I being called to the cure of a very honeſt woman, which was troubled with the ſame diſeaſe, ſtrongly withſtood the Phyſitians and Chirurgeons affirming it to be a *Cancer*, for the tumor had taken no deep root, the habit of the part was not changed from the native colour, the veins about it were not ſwollen, neither was there any other convincing ſign of a *Cancer*. For this ſame woman had her courſes at their due and uſuall time, and was well liking, and had a good colour in her face and body, was free from all ſort of pain, unleſſe when you preſſed down the part affected. Beſides thence forward the tumor grew not at all; no other evill accident befel her, yea verily ſhe lives merrily, and well both in body and mind.

How you may know a Wen from a *Cancer*.

CHAP. XXI.

Of a Ganglion *more particularly ſo called.*

What a *Ganglion* properly ſo called is.

THere are alſo certain ſmall tumors of the kind of *Lupiæ* or Wens, which grow on divers parts of the body, but chiefly on the wriſts of the hands, and ankles of the feet, being called by a more particular name *Ganglia*; they appear on the top of the skin, neither do they ever lie deep. The cauſe of them is either the imbecillity of a nerve or tendon got by wreſting, extenſion, a blow, labour, or other ſuch like cauſe. Through which occaſion the alimentary juice which flowed to theſe parts, ſeeing it can neither be concocted, nor aſſimilated into the proper ſubſtance, is converted into an humor of the like nature cold, and groſs, which in continuance of time heaping it ſelf up by little and little about the fibers, and the very ſubſtance of the tendon, concretes into a tumor.

The cauſes.

What *Ganglia* may not be cured with iron Inſtruments.

It is not fit to uſe any iron inſtrument to theſe *Ganglia* which poſſeſs the tendons and joints, but only apply *Ammoniacum* and *Galbanum* diſſolved in Vinegar and *Aqua vitæ*: as Re

gum

gummi ammon.& ſagapeni in aqua vitæ diſſolutorum, an. ℥j. *coquantur ſuper cineres calidos ad formam emplaſtri,ſub finem adde ſulphuris vivi ſubtiliter pulveriſati* ℥ß, *fiat empl. ad uſum.* Alſo the Emplaiſter of *Vigo* with double *Mercury* would be good for the ſame purpoſe.

The tumor ſoftned by theſe remedies,muſt be wrought,rubbed, or preſſed,ſo long,untill the bladder or bag be broken under your fingers,which I have divers times done; then it will be expedient preſently to apply and bind hard thereunto a plate of lead rubbed with Quick-ſilver,which may waſt and conſume the remainder of the tumor.

Sometimes there are *Ganglia* ſeen hanging by a ſmall root,as it were a ſtring; wherefore they muſt be tied with a ſtring at the root,and every day twitched harder and harder, till ſuch time as they fall off. The reſt of the cure may be eaſily performed by the common rules of Art.

CHAP. XXII.

Of the Strumæ *or* Scrophulæ,*that is,the Kings-evill.*

What the *Scrophulæ* or Kings-evill is.

THe *Scrophulæ* are œdematous tumors ariſing in the glandulous parts, as the breſts,armholes, groins, but chiefly in the glandules of the neck. They appear either one or many,according to the quantity of that matter from whence they proceed,commonly contained in their proper ciſt,or bag, as *Atheromaes*, *Steatomaes*, and *Melicerides* are.

Their materiall cauſe. How they differ from other glandulous tumors.

They are made of a groſſe,cold,viſcid,and phlegmatick matter with ſome admixture of melancholy. They differ from other glandulous tumors;firſt in number, for moſt uſually there appear many of them united together,ſpringing from ſomewhat a deeper root than glandulous tumors doe;ſome of them are moveable,otherſome woven with the neighbouring nerves,remaining unremovable.

Ganglia appear fewer in number,and are without pain; but *Scrophulæ* oftentimes are painfull,eſpecially when they wax hot by putrefaction;ſo that ſometimes they degenerate into cancerous ulcers, not to be touched by inſtruments nor acrid medicines.

Their cure by diet.

Phlegmatick, melancholick, and gluttonous perſons,and ſuch as are accuſtomed to feed on cold and moiſt nouriſhments, as fiſh and cold water, and lead a ſedentarie and idle life, are ſubject to the *Scrophulæ*. They are cured by a moſt ſlender diet, for ſo the native heat by want of nouriſhment turned upon the material cauſe of ſuch like tumors,waſts it.

Emollient and reſolving medicines.

And they are cured by purging of the ſuperfluous humors, and alſo by application of emollient reſolving,and ſuppurating topick medicines,after this following manner. ℞ *Mucaginis alth.fœnugr.& ficuum ping. an.* ℥ij,*olei liliorum, & chamæm.an.* ℥j,*pinguedinis anſeris & axungiæ porci* ℥ß, *Terebinth. Ven.* ℥iß, *ammoniaci, & galbani in aceto diſſolutorum an.* ℥j. *ceræ novæ quantum ſatis,fiat cerotum ſecundum artem ad modum diachyli magni.*

The ointment for the French diſeaſe,and the Emplaiſter of *Vigo* with *Mercury*, are excellent for this purpoſe,eſpecially if we continue ſo long untill the Patient come to Salivation,for ſo nature will disburden it ſelf of the humor, generating the *Scrophulæ*, which I have ſometimes tried with happy ſucceſſe. ℞ *Emplaſtri diachyl. alb. & mag.cerati æſopi deſcriptionis Philagrii, an.* ℥ij. *Terebinth. claræ* ℥j. *olei liliorum parum, fiat emplaſtrum ſatis molle.* But if the *Scrophulæ* cannot by this means be reſolved,but as it oft-times happens, tend to ſuppuration, you muſt uſe ſuppuratives,as ℞ *rad. alth. & liliorum,an.* ℥iij. *coquantur in aqua communi, piſtentur, trajectis adde capitum allorum ſub cineribus coctorum* ℥iij,*olei liliorum,& ping.anſeris & anat. an.* ℥iß,*farinæ ſeminis lini quantum ſatis,formetur cataplaſma.*

Suppuratives.

A note to be obſerved in opening *Scrophulæ* tumors.

Here we muſt admoniſh the Chirurgeon, that he open not the *Scrophulæ* before that all the contained humor be fully and perfectly turned into *pus* or matter;otherwiſe the reſidue of the humor will remain crude, and will ſcarſe in a long time be brought to maturation; which precept muſt be principally obſerved in the *Scrophulæ*, and alſo ſometimes in other abſceſſes,which come to ſuppuration. For we muſt not as ſoon as any portion of the contained humors appears converted into *pus*,procure and haſten the apertion. For that portion of the ſuppurated humor,cauſes the reſt ſooner to turn into *pus*, which you may obſerve in inanimate bodies. For fruits which begin to periſh and rot,unleſs we preſently cut away the putrefying part,the reſidue quickly becomes rotten;there is alſo another reaſon; The native heat is the efficient cauſe of ſuppuration; it therefore (the ſore being opened) diminiſhed and weakned by reaſon of the diſſipation of the ſpirits,evacuated together with the humor,will cauſe the remaining portion of the humor not to ſuppurate, or that very hardly, and with much difficulty. Yet if the tumified part be ſubject,by its own nature,to corruption and putrefaction, as the fundament;if the contained matter be malign,or critical,it will be far better to haſten the apertion.

Naturall heat the cauſe of ſuppuration.

The Chirurgicall manner of curing *Scrophulæ*.

There is alſo another way of curing the *Scrophulæ*,which is performed by the hand. For ſuch as are in the neck;and have no deep roots,by making inciſion through the skin, are pulled and cut away from theſe parts with which they were intangled. But in the performance of this work, we take ſpeciall care,that we doe not violate or hurt with our inſtrument,the jugular veins, the ſleepy arteries,or recurrent nerves. If at any time there be danger

ger of any great efflux of bloud,after they are plucked from the skin, they muſt be tied at their roots, by thruſting through a needle and thred,and then binding the thred ſtrait on both ſides, that ſo bound they fall off by themſelves by little and little without any danger. The remainder of the cure may be performed according to the common rules of Art.

CHAP. XXIII.

Of the Feaver which happens upon an œdematous Tumor.

How an intermitting Quotidian happens upon œdematous tumors.

HAving ſhewed all the differences of œdematous tumors,it remains that we briefly treat of the Symptomatical feaver,which is ſometimes ſeen to happen upon them.This therefore retaining the motion of the humor by which it is made, is commonly of their kind,which they name Intermitting Quotidians. Now the fit of a Quotidian comes every day, and in that repetition continues the ſpace of eighteen hours;the reſidue of the day it hath manifeſt intermiſſion.

The cauſe of a Quotidian feaver.

The primitive cauſes of this feaver are,the coldneſſe and humidity of the air encompaſſing us, the long uſe of cold meats and drinks,and of all ſuch things as are eaſily corrupted,as Summer fruits,crude fiſhes,and laſtly,the omiſſion of our accuſtomed exerciſe.

The antecedent cauſes are a great repletion of tumors,and theſe eſpecially phlegmatick. The conjunct cauſe, is phlegm putrefying in the habit of the body, and firſt region thereof without the greater veins.

The Signs.

The ſigns of this feaver are drawn from three things;as firſt naturall;for this Feaver or Ague chiefly ſeizes upon theſe which are of a cold and moiſt temper,as Old-men, Women, Children, Eunuches,becauſe they have abundance of phlegm; and it invades Old-men by its own nature,becauſe their native heat being weak, they cannot convert their meats,then taken in a ſmall quantity,into laudable blood,and the ſubſtance of the parts.But it takes children by accident,not of its ſelf,and the own nature,for children are hot and moiſt;but by reaſon of their voracity,or greedineſs,and their violent,inordinate,aud continuall motion after their plentifull feeding,they heap up a great quantity of crude humors fit matter for this feaver;whereby it comes to paſſe, that fat children are chiefly troubled with this kind of feaver, becauſe they have the paſſages of their bodies ſtrait and ſtopped, or becauſe they are ſubject to Worms, they are troubled with pain, by corruption of their meat; whence ariſeth a hot diſtemper by putrefaction,and the elevation of putrid vapors, by which the heart being moleſted,is eaſily taken by this kind of feaver.

How children come to be ſubject to Quotidian feavers.

From things not naturall,the ſigns of this feaver are thus drawn.It chiefly takes one in Winter, and the Spring,in a cold and moiſt Region,in a ſedentary and idle life, by the uſe of meats,not only cold and moiſt,but alſo hot and dry,if they be devoured in ſuch plenty, that they overwhelm the native heat.

How phlegmatick humors happen to be generated by hot and dry meats.

For thus wine,although it be by faculty and nature,hot, and dry, yet taken too immoderately,it accumulates phlegmatick humors, and cauſes cold diſeaſes.Therefore drunkenneſs,gluttony,crudity,bathes and exerciſes preſently after meat,being they draw the meats as yet crude into the body and veins;and to conclude, all things cauſing much phlegm in us, may beget a Quotidian feaver. But by things contrary to nature, becauſe this feaver uſually follows cold diſeaſes,the Center, Circumference,and Habit of the body being refrigerated.

The ſymptoms of Quotidians.

The ſymptoms of this feaver are,the pain of the mouth of the ſtomack, becauſe that phlegm is commonly heaped up in this place,whence follows a vomiting, or caſting up of phlegm;the face looks pale,and the mouth is moiſt, without any thirſt, oftentimes in the fit it ſelf;becauſe the ſtomack flowing with phlegm,the watery and thinner portion thereof continually flows up into the mouth and tongue,by the contiuuity of the inner coat of the ventricle common to the gullet and mouth.

The manner of the pulſe and heat in a Quotidian.

It takes one with coldneſs of the extreme parts,a ſmall and deep pulſe,which notwithſtanding in the vigour of the fit,becomes more ſtrong,great, full,and quick. Juſt after the ſame manner,as the heat of this feaver at the firſt touch appears mild, gentle,moiſt and vaporous;but at the length it is felt more acrid, no otherwiſe than fire kindled in green wood,which is ſmall, weak,and ſmoakie at the firſt; but at the length when the moiſture being overcome,doth no more hinder its action, it burns and flames freely.

Critical ſweats. The urin.

The Patients are freed from their fits with ſmall ſweats,which at the firſt fits break forth very ſparingly,but more plentifully when the *Criſis* is at hand;the urin at the firſt is pale and thick,and ſometimes thin,that is, when there is obſtruction. But when the matter is concoct,as in the ſtate,it is red:if at the beginning of the fit they caſt up any quantity of phlegm by vomit,and that fit be terminated in a plentifull ſweat, it ſhews the feaver will not long laſt;for it argues the ſtrength of nature, the yeelding and tenuitie of the matter flying up,and the excretion of the conjunct cauſe of the feaver.

Why Quotidians are oftimes long. Into what diſeaſes a Quartain uſually changes.

A Quotidian feaver is commonly long,becauſe the phlegmatick humor being cold, and moiſt by nature,is heavy and unapt for motion;neither is it without fear of a greater diſeaſe,becauſe oft-times it changes into a burning, or quartain feaver,eſpecially if it be bred

of

of salt Phlegme; for saltness hath affinity with bitterness, wherefore by adustion it easily degenerates into it, so that, it need not seem very strange, if salt phlegm by adustion turn into choler, or melancholy. Those who recover of a Quotidian feaver, have their digestive faculty very weak; wherefore they must not be nourished with store of meats, nor with such as are hard to digest. In a Quotidian the whole body is filled with crude humors, whereby it comes to passe that this Feaver oft-times lasts sixty dayes. But have a care, you be not deceived, and take a double tertian for a Quotidian, because it takes the Patient every day as a Quotidian doth. Verily it will be very easie to distinguish these Feavers by the kind of the humor, and the propriety of the symptomes and accidents; beside, Quotidians commonly take one in the evening, or the midst of the night, as then when our bodies are refrigerated by the coldness of the air caused by the absence of the Sun. Wherefore then the cold humors are moved in us, which were bridled a little before by the presence and heat of the Sun. But on the contrary, double tertians take one about noon. The shortness and gentleness of the fit, the plentifull sweat breaking forth, the matter being concocted, causes us to think the Quotidian short and salutary.

How to distinguish a quotidian from a double tertian.

The cure is performed by two means; to wit, Diet, and Pharmacy. Let the Diet be slender and attenuating, let the patient breath in a cleer air moderately hot and dry; let his meats be bread well baked, cock or chicken broths in which have been boiled the roots of Parsly, Sorrell and the like.

Diet.

Neither at sometimes will the use of hot meats, as those which are spiced and salted, be unprofitable, especially to such as have their stomach and liver much cooled. Let him eat Chickens, Mutton, Partridge and small birds, river fishes and such as live in stony waters fryed or boiled, rear egs and such like. These fruits are also good for him, Raisons, stewed Prunes, Almonds and Dates. Let his drink be small white wine mixed with boiled water. Moderate exercises will be good, as also frictions of the whole body: sleep taken at a fitting time, and proportioned to waking, so that the time of sleep fall not upon the time of the fit; for then it hurts very much; for calling the heat to the inner parts, it doubles the raging of the feaverish heat inwardly in the bowels.

When the use of spiced and salted meats are fit.

When sleep is hurtfull.

For the passions of the mind, the patient must be merry, and comforted with a hope shortly to recover his health. It seems not amisse to some, at the coming of the fit to put the feet and legs into hot water, in which Chamomill, Dill, Melilot, Marjerom, Sage, and Rosemary have been boiled.

The medicines shall be such syrups as are called digestive and aperitive, as syrup of Wormwood, Mints, of the five opening roots, *Oxymel* with a decoction of Chamomill, Calamint, Melilot, Dill, and the like, or with common decoctions. The Purgatives shall be *Diaphenicon*, *Electuarium Diacarthami*, *Hiera picra*, Agarick, Turbith, of which you shall make potions with the water of Mints, Balm, Hyssop, Sage, Fennell, Endive or the like, *Pillulæ aureæ* are also good. These purgatives shall sometimes be given in form of a bole with sugar, as the Physitian being present shall think most fit and agreeable to the nature of the Patient.

Medicines.

About the state of the disease, you must have a care of the stomach and principally of the mouth thereof, as being the chief seat of phlegm; wherefore it will be good to anoint it every other day with oil of Chamomill mixed with a little white wine, as also to unlade it by taking a vomit of the juice of Radish, and much *Oxymel*, or with the decoction of the seeds and roots of *Asarum* and Chamomill; and syrup of vinegar will be very good, especially at the beginning of the fit, when nature and the humors begin to move; for an inveterate Quotidian, though you can cure it by no other remedy, nothing is thought to conduce so much as one dram of old Treacle taken with sugar in form of a bole, or to drink it dissolved in *Aqua vitæ*.

Care must be had of the stomach. Vomits.

The use of Treacle in an inveterate quotidian.

CHAP. XXIV.

Of a Scirrhus, *or an hard tumor proceeding of Melancholy.*

HAving shewed the nature of tumors caused by blood, choler and phlegm, it remains we speak of these, which are bred of a melancholick humor; of these there are said to be four differences. The first is of a true and legitimate *Scirrhus*, that is, of an hard tumor endued with little sense, and so commonly without pain, generated of a naturall melancholick humor. The second is, of an illegitimate *Scirrhus*, that is of an hard tumor insensible, and without pain, of a a Melancholick humor concrete by too much resolving and refrigerating. The third is of a cancrous *Scirrhus* bred by the corruption and adustion of the Melancholick humor. The fourth of a phlegmonous, *Erysipelous* or *Oedematous Scirrhus*, caused by Melancholy mixed with some other humor. The cause of all these kinds of Tumors is a grosse, tough and tenacious humor concrete in any part. But the generation of such an humor in the body happens either of an ill and irregular diet, or of the unnaturall affects

What a true and legitimate *Scirrhus* is. What an illegitimate *Scirrhus* is.

of the liver or ſpleen, as obſtruction; or by ſuppreſſion of the *Hæmorrhoids* or Courſes.

The Signs. The ſigns are hardneſs, renitency, a blackiſh colour, and a dilation of the veins of the affected part with blackiſhneſs, by reaſon of the abundance of the groſs humor. The illegitimate or baſtard *Scirrhus* which is wholly without pain and ſenſe, and alſo the cancerous

Prognoſtick. admit no cure, and the true legitimate ſcarce yeeld to any. Thoſe which are brought to ſuppuration, eaſily turn into Cancers and fiſtulaes; theſe tumors though in the beginning they appear little, yet in proceſs of time they grow to a great bigneſs.

CHAP. XXV.

Of the cure of a Scirrhus.

Diet. THe Cure of a *Scirrhus* chiefly conſiſts of three heads. Firſt, The Phyſitian ſhall preſcribe a convenient diet, that is ſober and moderate in feeding, tending to humidity, and indifferent heat; for his manner of life, let it be quiet and free from all perturbation of anger, grief and ſadneſs, as alſo abhorring the uſe of venery. The ſecond is placed in the evacuation of the antecedent matter, as by Phlebotomy, if need require, and by purging, by procuring the *Hæmorrhoids* in men, and the courſes in women; let purgations be preſcribed of *Diacatholicon*, *Hiera*, *diaſenna*, polypody, *Epythymum* according to the mind of the learned Phyſitian. The third conſiſts in the convenient uſe of Topick medicines, that is, emollient at the beginning, and then preſently reſolving, or rather ſuch as are mixed both of reſolving and emollient faculties,

Lib. 2. ad Glauconem. as *Galen* teaches; for by the uſe of only emollient things there is danger of putrefaction and a *Cancer*, and only of reſolving there is fear of concretion, the ſubtiler part being reſolved, and the groſſer ſubſiding.

Emollients. The emollient ſhall be thus: ℞ *Rad. alth. lib. ſ. rad. liliorum* ℥iij. *coquantur in aqua com. piſtentur, trajiciantur per ſetaceum, addendo olei chamæm. & lilior. an.* ℥ij. *æſipi humidæ* ℥ß. *emplaſtri diachyl. alb. cum oleo liliorum diſſoluti* ℥iij, *ceræ albæ quantum ſit ſatis, fiat cerotum.* Or ℞ *gummi ammoniaci, galb. bdellii, ſtyracis liquidæ in aceto diſſolutorum, an.* ℥j, *diachyl. mag.* ℥jß, *olei liliorum, & axungiæ anſeris, an.* ℥j. *ceroti æſip. deſcriptione Philagr.* ℥ij. *liqueſcant omnia ſimul, ceræ quantum ſit ſatis, ut inde fiat cerotum ſatis molle.* When you have ſufficiently uſed emollient things, fume the tumor with ſtrong Vinegar and *Aqua vitæ* poured upon a piece of a Milſtone, flint or brick heated very hot; for the ſo mollified humor will be rarified, attenuated and reſolved; then ſome while after renew your emollients, and then again apply your reſolvers to waſt that which remains, which could not be performed together and at once; for

Lib. 2. ad Glau. thus *Galen* healed a ſcirrhus in *Cercilius* his ſon. Goats dung is very good to diſcuſſe Scirrhous tumors; but the Emplaiſter of *Vigo* with a double quantity of Mercury

The efficacy of the Empl. of Vigo with Mercury. is effectuall above the reſt, as that which mollifies, reſolves and waſts all tumors of this kind.

CHAP. XXVI.

Of a Cancer *already generated.*

What a *Cancer* is. A *Cancer* is an hard tumor rough and unequal, round, immoveable, of an aſh or livid colour, horrid by reaſon of the veins on every ſide, ſwollen with black blood, and ſpred abroad to the ſimilitude of the ſtretched out legs and claws of a Crab. It is a tumor hard to be known at the firſt, as that which ſcarce equalls the bigneſs of a Chick, or *Cicer*, after a little time it will come to the greatneſſe of a Haſell nut, unleſs peradventure provoked by ſomewhat too acrid medicins it ſodainly encreaſe being grown bigger, according to the meaſure of the encreaſe it torments the patient with pricking pain, with acrid heat, the groſſe blood reſiding in the veins growing hot, and inferring a ſenſe like the pricking of needles, from which

The nature of the pain. notwithſtanding the Patient hath oft-times ſome reſt. But becauſe this kind of tumor by the veins extended and ſpred about it like claws and feet, being of a livid and aſh colour,

The reaſon of the name. aſſociated with a roughneſs of the skin and tenacity of the humor, repreſents, as it were, the toothed claws of the Crab, therefore I thought it not amiſſe here to inſert the Figure of the Crab, that ſo the reaſon both of the name and thing might be more perſpicuous.

The

The figure of the Crab, called Cancer *in Latin.*

CHAP. XXVII.

Of the cauſes, kinds, and prognoſticks of a Cancer.

HEre we acknowledge two cauſes of a *Cancer*, the antecedent, and conjunct. The antecedent cauſe depends upon the default of irregular diet, generating and heaping up groſſe and feculent blood; by the morbifick affection of the Liver diſpoſed to the generation of that blood; by the infirmity or weakneſs of the ſpleen in attracting and purging the blood; by the ſuppreſſion of the Courſes or Hæmorrhoids, or any ſuch accuſtomed evacuation. The conjunct cauſe is that groſs and melancholick humor ſticking and ſhut in the affected part as in a ſtrait. That melancholick blood which is more mild, and leſs malign, only increaſed by a degree of more fervid heat, breeds a not ulcerated *Cancer*, but the more malign and acrid cauſes, an ulcerated. For ſo the humor which generated Carbuncles, when it hath acquired great heat, acrimony, and malignity, corrodes, and ulcerates the part upon which it alights. A *Cancer* is made more fierce and raging by meats inflaming the blood, by perturbations of the mind, anger, heat, and medicines too acrid, oily, and emplaſtick, unfitly applied, both for time and place.

The cauſes of a Cancer.

The cauſes of a not ulcerated Cancer.

Amongſt the ſorts or kinds of *Cancers*, there be two chiefly eminent, that is, the ulcerated or manifeſt *Cancer*, and the not ulcerated or occult. But of *Cancers* ſome poſſeſs the internall parts, as the Guts, Womb, Fundament; others the externall, as the Breſts; alſo there is a recent, or late bred *Cancer*, and alſo an inveterate one. There is one ſmall, another great, one raging and malign, another more mild. Every *Cancer* is held almoſt incurable, or very difficult to be cured, for it is a diſeaſe altogether malign, to wit, a particular Leproſie. Therefore ſaith *Aetius*, a *Cancer* is not eaſily ſtaied untill it hath eaten even to the innermoſt of the part which it poſſeſſes. It invades women more frequently than men, and thoſe parts which are lax, rare, fungous, and glandulous, and therefore opportune to receive a defluxion of a groſs humor, ſuch are the breſts and all the emunctories of the noble parts. When it poſſeſſes the breſts, it often cauſes inflammation to the armholes, and ſends the ſwelling ever to the glandules thereof; whereupon the Patients do complain that a pricking pain, even pierces to their hearts. But this ſame pain alſo runs to the clavicles, and even to the inner ſide of the ſhoulder-blades and ſhoulders. When it is increaſed, and covers the noble parts, it admits no cure but by the hand; but in decayed bodies, whoſe ſtrength fail, eſpecially if the *Cancers* be inveterate, we muſt not attempt the cure, neither with inſtrument, nor with fire, neither by too acrid medicines, as potentiall cauteries: but we muſt only ſeek to keep them from growing more violent, and from ſpreading further, by gentle medicines, and a palliative cure. For thus many troubled with a *Cancer*, have attained even to old age. Therefore *Hippocrates* admoniſhes us, that it is better not to cure occult, or hidden *Cancers*; for the Patients cured (ſaith he) do quickly die, but ſuch as are not cured live longer.

The ſorts and differences of Cancers.

Aetius lib. 6.

The parts moſt ſubject to Cancers.

What Cancers one muſt not undertake truely to cure.

CHAP. XXVIII.

Of the Cure of a Cancer *beginning, and not yet ulcerated.*

A *Cancer* beginning is oft hindred from encreaſing, before it faſten its roots, but when it hath once encreaſed, it admits no cure but by iron, as that which contemns, by reaſon of the malignity & contumacy, the force of all medicines. *Galen* affirms, he cured a *Cancer* not ulcerated.

Lib. 2. ad Glau.

Now that cure is performed by medicines, purging melancholy, by Phlebotomy, when the ſtrength and age of the Patient may well endure it, by ſhunning all things which may breed il and faeculent blood. The diſtemper of the Liver muſt firſt be corrected, the Spleen ned, as alſo the part affected; in men the Hamorrhoides, in women their Courſes muſt be procured.

Diet.

Therefore thick and muddy wines, vinegar, brown bread, cold herbs, old cheeſe, old and ſalted fleſh, beef, veniſon, goat, hare, garlick, onions and muſtard; and laſtly all acrid, acid and other ſalt things, which may by any means incraſſate the blood, and inflame the humors, muſt be eſchewed. A cooling and humecting diet muſt be preſcribed; faſting eſchewed, as alſo watchings, immoderate labours, ſorrow, cares, and mournings; let him uſe ptiſans, and in his broths boil Mallows, Spinace, Lettuce, Sorrell, Purſlain, Succory, Hops, Violets, Borrage and the four cold ſeeds. But let him feed on Mutton, Veal, Kid, Capon, Pullet, young Hares, Partridges, Fiſhes of ſtony rivers, rear Egs; and uſe white wine but moderately for his drink.

How to handle the cancerous part.

Antidotes.

Aſſes milk.

The part affected with the *Cancer* muſt be gently handled, and not overburdened by over hard or heavy things, or by too ſolid or fat Emplaiſters; on the contrary gentle and mitigating medicines muſt be uſed; applying alſo at certain times ſuch things as reſiſt venome or poyſon, as Treacle and Mithridate. Aſſes milk is exceeding fit to aſſwage the acrimony of the cancerous humor. Therefore it muſt not only be taken inwardly, but alſo applyed outwardly to the cancerous ulcer, making thereof a fomentation.

CHAP. XXIX.

Of the cure of an ulcerated Cancer.

The Signs.

AN Ulcerated *Cancer* hath many ſigns common with that which is not ulcerated, as the roundneſſe of the tumor, the inequality, roughneſs, and pain; to the judgment of the eye, the tumor ſeems ſoft, but it is hard to the touch; the Ulcer is filthy, with lips, thick, ſwoln, hard, knotty, turned out, and ſtanding up, having a horrid aſpect, and caſting forth ichorous, filthy, and carion-like filth, ſometimes black, ſometimes mixed with rotten filth, and otherwhiles with much bloud. This kind of ulcer is malign, rebellious, and untractable, as that which contemns mild remedies, and becomes more fierce, by acrid and ſtrong; the pain, feaver, and all the ſymptoms being increaſed, from whence the powers are dejected, the waſting and conſumption of the body follows and laſtly death. Yet if it be ſmall, and in a part which may ſuffer amputation, the body being firſt purged, and blood drawn, the ſtrength of the Patient not diſſwading, it will be convenient to uſe the hand, and to take hold of, and cut away whatſoever is corrupt, even to the quick, that no fear of contagion may remain, or be left behind. The amputation finiſhed, the bloud muſt not be preſently ſtopped, but permitted to flow out in ſome meaſure, yea verily preſſed forth all about it, that ſo the veins ſwoln with black and melancholy bloud may be disburdened. When you have taken a ſufficient quantity of blood, the place muſt be ſeared with an actuall cautery. For that will ſtrengthen the part affected, draw forth the venenate quality, and alſo ſtay the defluxion. Then muſt you apply mitigating medicines, and procure the falling away of the Eſchar. To conclude, that which remains, muſt be performed according to the cure of other ulcers. Now we know and underſtand that all the *Cancer* is cut away, and all the malignity thereof extinct, when the ulcer caſts forth laudable matter, when that good fleſh begins to grow by little and little, like to the grains of a Pomegranat, the pricking pain, and all the ſymptoms being aſſwaged. Yet the cure of an ulcerated *Cancer* which ſhall poſſeſs the lips may be more happily and mildly performed, no cauſtick medicine being applyed after ſection, ſo alſo that ſcarce any deformity will be left, when it is cicatrized. Which new and never formerly tried, or written of way, as far as I know, I found and performed in a man of fifty years old. Doctor *John Altine*, a moſt learned Phyſitian being called to Counſell, *James Guilleneau*, and Maſter *Euſtachius* the Kings Chirurgeons, and *John Le Ieune* the Duke of *Guiſe* his moſt worthy Chirurgeon being preſent.

How & where a *Cancer* may be cut away.

What to be obſerved in cutting away a *Cancer*.

The benefit of applying a cautery after amputation of the *Cancer*.

Signs that a *Cancer* is well taken away.

The way is this; The *Cancer* muſt be thruſt through the lips on both ſides, above and below

below with a needle and thred, that ſo you may rule and govern the *Cancer* with your left hand, by the benefit of the thred (leſt any portion thereof ſhould ſcape the inſtrument in cutting) and then with your Sizers in the right hand, you may cut it off all at once; yet it muſt be ſo done, that ſome ſubſtance of the inner part of the lip, which is next to the teeth may remain, (if ſo be that the *Cancer* be not grown quite through) which may ſerve as it were for a foundation to generate fleſh to fill up the hollowneſs again. Then when it hath bled ſufficiently, the ſides and brinks of the wound muſt be ſcarified on the right and left ſides, within, and without, with ſomewhat a deep ſcarification, that ſo (when we would draw together the ſides and lips of the wound, by that manner of ſtitching, which is uſed in an hare lip) we may have the fleſh more pliant and tractable to the needle and thred. The reſidue of the cure muſt be performed juſt after the ſame manner as we uſe in hare lips; of which we ſhall treat hereafter.

A new and obſervable way of taking away a *Cancer* from the lip.

CHAP. XXX.

Of the Topicke medicines to be applied to an ulcerated, and not ulcerated Cancer.

WE at the beginning uſe repercuſſive medicines, ſuch as are the juices of Night-ſhade, Plantain, Henbane, Lettuce, Sorrell, Houſeleek, Water Lentill or Ducks meat, Knotgraſſe, Pomegranates, and the like. Alſo *oleum roſarum emphacinum*, the powders of Sumach, Berberies, Litharge, Ceruſe, Burnt-lead, *Tutia*, Quickſilver, and the like. Of which you may compoſe Fomentations, Liniments, Ointments, Cataplaſmes, Emplaiſters. *Emplaſtrum Diacalcitheos* diſſolved with juice of Nightſhade, and oil of Roſes is very fit for not ulcerated *Cancers*. *Pompholix*, or *Tutia*, waſhed in juice of Nightſhade, or Plantain, is very good for ulcerated *Cancers*. Beſides this following medicine is very commendable.

Repelling medicines.

℞ *Lytharg. & ceruſ. an.* ℥j, *terantur in mortario plumb. cum oleo roſar. donec reducantur ad conſiſtentiam linimenti vel unguenti*; and there may be uſe of a reſolving and repercuſſive ointment, as ℞ *plumbi uſti loti, pompholthuris, an.* ʒijß, *abſinth. pontic.* ʒß, *olei roſarum* ℥iij, *ceræ* ʒ vj, *ſucci ſolani, quantum ſufficit ad unguenti craſſitudinem*. They very much commend *Theodorickes* Emplaiſter to aſſwage the pain of ulcerated *Cancers*.

℞ *olei roſ. ceræ alb. an.* ℥ijß, *ſucci granat. & ſolani, an.* ℥ij, *ceruſæ lotæ* ℥j, *plumbi uſti, loti, & tuthiæ præpar. an.* ʒß, *thuris, maſtich. an.* ʒij, *fiat empl. molle*. This following ointment I have often uſed with good ſucceſſe.

Theodorickes Emplaiſter.

℞ *Theriac. veter.* ℥j, *ſucci cancrorum* ʒß, *ſucci lactucæ & olei roſar. an.* ℥iß, *vitel. ovorum ſub cinerib. cocti.* ij, *camphor.* ʒß. *piſtentur omnia in mortario plumb. & fiat unguentum.*

℞ *Spum. argent. axungiæ porci recentis, ceræ alb. an.* ℔ß, *olei boni* ℥viij, *vitel. ovorum aſſat.* ℥iij, *fiat unguent. ſervetur uſui*. And when you will uſe it, mix it with a little ointment of Roſes. I have alſo mitigated great pain by applying Leaches to an unulcerated *Cancer*, in that part where the torment was moſt vehement, by disburdening the part of ſome portion of the malign humor; which ſame thing I have done by application of yong Whelps, or Kitlings, or Pidgeons, or Chickens cut long waies, and preſently applied to the ulcer, and now and then changed as ſoon as their heat ſeems diſſolved; and others applied for the naturall heat in an anodyne or mitigating medicine. *John Baptiſta Theodoſius* in his Epiſtles, writes, that a cataplaſme of the herb *Eryſimum* or Cadlock, being beaten, is very good to be applied to a *Cancer* not ulcerated; but if the *Cancer* be ulcerated, he boils this ſame herb in *Hydromel*, and ſo by injections and lotions cleanſes the ulcer, and mitigates the pain. If the *Canter* affect the womb, the patient feels the pricking of the pain in the groins above the *pecten*, and in the Kidneyes, and is often troubled with a difficulty of making water; but when it is ulcerated it poures forth filth or matter exceeding ſtinking and carion-like, and that in great plenty; the filthy vapour of which carryed up to the heart and brain cauſes often ſwounding. Now to mitigate the pains of ſuch like places, the following medicines are of good uſe.

Leaches.

The application of Whelps, Chickens, &c.

Epiſt. 21. The eſtate of *Eryſimum*. The ſigns of the *Cancer* in the womb.

℞ *Mucag. ſemin. lini; ſanugr. extract. in aqua roſar. & plantaginis quod ſatis eſt*; Of this being warm make a fomentation.

℞ *Rad. Atheæ* ℔ß. *coquatur in hydromelite, piſtetur & trajiciatur, addendo olei roſar. parum, fiat Cataplaſma*. Alſo you ſhall make divers peſſaries according to the different kinds of pain; alſo make injections of the juice of Plantain, Knotgraſſe, Lettuce, Purſlain mixed together, and agitated or laboured in a leaden mortar with a little oil of Roſes; for this kind of medicine is commended by *Galen* in every kind of ulcerated *Cancers*. Alſo this following water is very profitable, and often approved by me. ℞ *Stercoris bubuli* ℔iiij. *herbæ Roberti, plantag. ſempervivi, byſcyami, portulac. lactuc. endiv. an. m.j. cancros fluviatiles, num.* xij. let them be all beaten together and diſtilled in a leaden Alembick, keep the liquor for uſe and with it make often injection into the part; or if the ſite of the part will permit, let the cancerous ulcers be waſhed therewith, and pledgets of lint ſteeped therein, be applyed and renewed

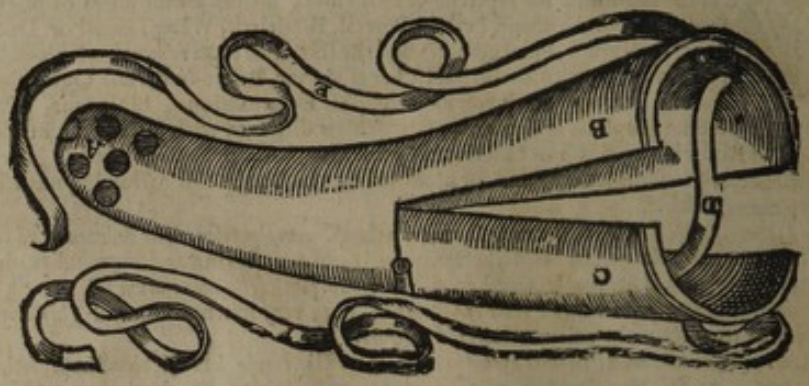
Lib. 9. Simpl.

Lib. 4. de comp. med. ſecundum gen.

ever and anon; for ſo the acrimony and force of the inflammation is retunded, and the pain aſſwaged. *Galen* beats into powder river Crabs burnt; the powder mixed with ointment of Roſes is moſt profitably applied upon lint to cancerous ulcers.

It will be very convenient to put into the neck of the womb the following inſtrument made of Gold or Silver, whereby the cancerous filth may have free and ſafe paſſage forth, and the filthy and putredinous vapors may more eaſily breath forth. Therefore let it be hollow quite through, ſome five or ſix fingers long, and about the bigneſs of ones thumb, at the upper end, perforated with many holes whereby the filth may have paſſage forth. Let the outer or lower end be ſome two fingers thick in the circumference, make it with a neat ſpring, that may hold that end open more, or leſs, according to the Phyſitians mind; let there be two ſtrings or laces put unto it, by which being tyed before and behind to the rowler, with which the woman ſhall girt her loins, the Device may be kept from falling, as you may ſee in the following figure.

A Vent made like a Peſſary for the womb affected with a cancerous ulcer.



A. *Shews the upper end perforated with five or ſix holes.*
B. *The lower end.*
C. *That part of the end which is opened by the ſpring, which is marked with the Letter* D.
EE. *The ſtrings or laces.*

Lib. 6. ſimp. Plates of Lead.

Neither is that remedy for not ulcerated *Cancers* to be contemned, which conſiſts of a plate of lead beſmeared with Quick-ſilver; for *Galen* himſelf teſtifies that lead is a good medicine for malign and inveterate ulcers. But *Guido Cauliacenſis* is a witneſs of ancient credit and learning, that ſuch plates of lead rubbed over with Quick-ſilver, to ſuch malign ulcers as contemn the force of other medicines, are as it were Antidotes, to waſt and overcome their malignity and evill nature. This kind of remedy, when it was preſcribed by that moſt excellent Phyſitian *Hollerius*, who commanded me to apply it to the Lady of *Montigni* Maid of Honour to the Queen mother, troubled with a *Cancer* in her left breſt, which equalled the bigneſs of a Wallnut, did not truely throughly heal it, yet notwithſtanding kept it from further growth. Wherefore at the length growing weary of it, when ſhe had committed herſelf to a certain Phyſitian boldly promiſing her quick help, ſhe tryed with loſſe of her life, how dangerous, and diſadvantagious the cure of a *Cancer* was, which is undertaken according to the manner of healing other ulcers; for this Phyſitian, when he had caſt away this our medicine, and had begun the cure with mollifying, heating and attractive things, the pain, inflammation and al the other ſymptomes encreaſing the tumor grew to that bigneſſe, that being the humor drawn thither could not be contained in the part it ſelf, it ſtretched the breſt forth ſo much, that it broke it in the middle, juſt as a Pomgranat cleaves when it comes to its full maturity; whereupon an immoderate flux of blood following, for ſtaying whereof he was forc't to ſtrew cauſtick powders thereon; but by this means the inflammation and pain becoming more raging, and ſwoundings coming upon her, ſhe poor Soul in ſtead of her promiſed health, yeelded up her ghoſt in the Phyſitians boſome.

A Hiſtory.

CHAP.

CHAP. XXXI.

Of the Feaver which happeneth in Scirrhous Tumors.

SUch a Feaver is a Quartain, or certainly coming near unto the nature of a Quartain, by reason of the nature of the Melancholick humor of which it is bred. For this shut up in a certain seat in which it makes the tumor, by communication of putrid vapours heats the heart above measure, & enflames the humors contained therein, whence arises a Feaver. Now therefore a quartain is a Feaver coming every fourth day, and having two dayes intermission. Why a quartain happens upon scirrhous tumors.

The primitive causes thereof are these things which encrease Melancholick humors in the body, such as the long eating of pulse, of course and burnt bread, of salt flesh and fish, of gross meats, as Beef, Goat, Venison, old Hares, old Cheese, Cabbage, thick and muddy wines and other such things of the same kind.

The antecedent causes are a heaped up plenty of Melancholick humors abounding over all the body. But the conjunct causes are Melancholick humors putrefying without the greater vessels, in the small veins and habit of the body.

We may gather the signs of a Quartain feaver from things which they call naturall, not naturall, and against nature; from things naturall, for a cold and dry temper, old age, cold and fat men, having their veins small, and lying hid, their spleen swollen and weak, are usually troubled with quartain Feavers. The signs.

Of things not naturall; this Feaver, or Ague is frequent in Autumne, not only because, for that it is cold and dry, it is fit to heap up Melancholick humors; but chiefly by reason that the humors by the heat of the preceding Summer are easily converted into adust Melancholy, whence far worser and more dangerous quartains arise, than of the simple Melancholick humor; to conclude, through any cold or dry season in a region cold and dry, men that have the like Temper easily fall into quartains; if to these a painfull kind of life full of danger and sorrow doth accrew. Why they are frequent in Autumne.

Of things contrary to nature; because the fits take one with painfull shaking, inferring as it were the sense of breaking or shaking the bones; further it taketh one every fourth day with an itching over the whole body, and oft-times with a thin skurfe and pustules, especially on the legs; the pulse at the beginning is little, slow, and deep, and the urine also is then white and waterish, inclining to somewhat a dark colour.

In the declination when the matter is concocted the urine becomes black, not occasioned by any malign Symptome or preternaturall exces of heat, (for so it should be deadly) but by excretion of the conjunct matter. The fit of the Quartain continues 24 houres, but the intermission is 48 houres. It often takes its originall from an obstruction, pain, and *Scirrhus* of the Spleen, and of the suppression of the courses and Hæmorrhoides. Prognostick.

Quartains taken in the Summer are for the most part short, but in the Autumn long, especially such as continue till Winter. Those which come by succession of any disease of the Liver, Spleen, or any other precedent disease are worse than such as are bred of themselves, and commonly end in a Dropsie. But those which happen without the fault of any bowels, and to such a patient, as will be governed by the Physitian in his Diet, infer no greater harm, but free him from more grievous and long diseases, as Melancholy, the Falling sickness, Convulsions, Madness, because the Melancholy humor, the author of such diseases is expelled every fourth day by the force of the fit of the Quartain. From what diseases a quartain frees one.

A Quartain Feaver, if there be no error committed, commonly exceeds not a year, for otherwise some Quartains have been found to last to the twelfth year according to the opinion of *Avicen:* the Quartain beginning in Autumn is oft-times ended in the following spring; the Quartain which is caused by adust blood, or choler, or Salt flegm, is more easily and sooner cured, than that which proceeds from an adust Melancholy humor; because the Melancholy humor, terrestriall of its own nature, and harder to be discussed than any other humor, is again made by adustion (the subtiller parts being dissolved and the grosser subsiding) more stubborn, gross, malign, and acrid. The cure is wholly absolved by two means, that is, by Diet and medicines. The diet ought to be prescribed contrery to the cause of the Feaver in the use of the six things not naturall, as much as lyes in our power. Wherefore the Patient shall eschew Swines flesh, flatulent, viscid and glutinous meats, fenny fowls, salt meats and Venison, and all things of hard digestion. The use of white wine indifferent hot and thin, is convenient to attenuate and incide the gross humor, and to move urine and sweat; yea verily at the beginning of the fit a draught of such wine will cause vomiting, which is a thing of so great moment, that by this one remedy many have been cured. Yet if we may take occasion and opportunity to provoke vomit there is no time thought fitter for that purpose then presently after meat; for then it is the sooner provoked, the fibers of the stomach being humected and relaxed, and the stomach is sooner turned to vomiting, whereupon follows a more plentiful, happy & easie evacuation of the Phlegmatique and Cholerick humor, and less troublesome to nature: and of all the crudities Diet. How much vomiting prevails to cure a quartain.

dities with which the mouth of the ventricle abounds in a Quartane, by reaſon of the more copious afflux of the Melancholick humor, which by his qualities cold and dry, diſturbes all the actions and naturall faculties. Moreover exerciſes and friction are good before meat; ſuch paſſions of the mind as are contrary to the cauſe from which this Feaver takes his originall, are fit to be cheriſhed by the patient; as Laughter, Jeſting, Muſick, and all ſuch like things full of pleaſure and mirth. At the beginning the patient muſt be gently handled and dealt withall, and we muſt abſtain from all very ſtrong medicines untill ſuch time, as the diſeaſe hath been of ſome continuance. For this humor, contumacious at the beginning when as yet nature hath attempted nothing, is again made more ſtubborn, terreſtriall and dry, by the almoſt fiery heat of acrid medicines. If the body abound with blood, ſome part thereof muſt be taken away by opening the Median or Baſilik vein of the left arm, with this caution, that if it appear more groſs and black, we ſuffer it to flow more plentifully; if more thin, and tinctured with a laudable red colour that we preſently ſtay it. The matter of this feaver muſt be ripened, concocted and diminiſhed with the Syrups of *Epithymum*, of *Scolopendrium*, of Mayden hair, Agrimony, with the waters of Hops, Bugloſs, Borage and the like. I ſincerely proteſt, next unto God, I have cured very many quartains by giving a portion of a little Treakle diſſolved in about ſome two ounces of *Aqua vitæ*, alſo ſometimes by two or three grains of Musk diſſolved in Muskadine, given at the beginning of a particular fit towards the generall declination of the diſeaſe, after generall purgations the humor and body being prepared, and the powers ſtrong; And certainly an inveterate Quartain can ſcarce ever bee diſcuſſed unleſs the body be much heated with meats and medicines. Therefore it is not altogether to be diſproved which many ſay, that they have driven away a quartain by taking a draught of wine every day as ſoon as they came forth of their bed, in which ſome leaves of Sage had been infuſed all the night. Alſo it is good a little before the fit to anoint all the ſpine of the back with oyls heating all the nervous parts, ſuch as are the oyl of Rue, Walnuts, of the Peppers, mixing therewith a little *Aqua vitæ*, but for this purpoſe the oyl of *Caſtoreum* which hath been boyled in an apple of *Coloquintida*, the Kernels taken out, upon hot coles to the conſumption of the half part, mixing therewith ſome little quantity of the powders of Pepper, Pelitory of *Spain* and *Euphorbium*, is excellent. Certainly ſuch like Inunctions are good not only to mitigate the vehemency of the terrible ſhaking, but alſo to provoke ſweats; for becauſe by their humid heat they diſcuſs this humor being dull and rebellious to the expulſive faculty, for the Melancholy is as it were the droſs and mud of the blood.

Medicines.

What quartains muſt be cured with refrigerating things.

Therefore if on the contrary the Quartain Feaver ſhall be cauſed by aduſt choler wee muſt hope for and expect a cure by refrigerating and humective medicines, ſuch as Sorrell, Lettuce, Purſlane, broths of the decoction of Cowcumbers, Gourds, Mellons and Pompions. For in this caſe if any uſe hot medicines, he ſhall make this humor moſt obſtinate by the reſolving of the ſubtiler parts. Thus *Trallianus* boaſts that he hath cured theſe kinds of Quartane Feaver by the only uſe of refrigerating *Epithemaes* being often repeated a little before the beginning of the fit. And this is the ſum of the Cure of true and legitimate intermitting Feavers. That is, of thoſe which are cauſed by one ſimple humor, whereby the Cure of thoſe which they call baſtard intermitting Feavers, may be eaſily gathered and underſtood; as which are bred by a humor impure and not of one kind, but mixt or compoſed by admixture of ſome other matter; for example, according to the mixture of divers humors Phlegmatick and cholerick, the medicines muſt alſo be mixt, as if it were a confuſed kind of Feaver of a *Quotidian* and *Tertian*; it muſt be cured by a medicine compoſed of things evacuating flegm and choler.

What baſtard Agues are, and how they muſt be cured.

CHAP. XXXII.

Of an Aneuriſma, *that is, the dilatation, or ſpringing of an Artery, Vein, or Sinew.*

What it is.

AN *Aneuriſma* is a ſoft tumor yeelding to the touch, made by the blood and ſpirit powred forth under the fleſh and Muſcles, by the dilatation or relaxation of an Artery. Yet the Author of the definitions ſeems to call any dilatation of any venous veſſell by the name of an *Aneuriſma*. *Galen* calls an *Aneuriſma* an opening made of the *Anaſtomaſis*, of an Artery. Alſo an *Aneuriſma* is made when an Artery that is wounded cloſeth too ſlowly, the ſubſtance which is above it being in the mean time agglutinated, filled with fleſh and cicatrized, which doth not ſeldome happen in opening of Arteries unskilfully performed and negligently cured; therefore *Aneuriſmaes* are abſolutely made by the *Anaſtomaſis*, ſpringing, breaking, *Eroſion*, and wounding of the Arteries. Theſe happen in all parts of the body, but more frequently in the throat, eſpecially in women after a painfull travail. For when as they more ſtrongly ſtrive to hold their breath, for the more powerfull expulſion of the birth, it happens that the Artery is dilated and broken, whence follows an effuſion of blood and ſpirits under the skin. The ſigns are, a ſwelling one while great, another ſmall, with a pulſation and a colour not varying from the native conſtitution of the skin. It is a ſoft tumor, and ſo yeelding to the impreſſion

In what parts they chiefly happen.

of

of the fingers that if it peradventure be ſmall, it wholly vaniſheth, the Arterious blood and ſpirits flying back into the body of the Artery, but preſently aſſoon as you take your fingers away, they return again with like celerity. Some *Aneuriſmaes* do not only when they are preſſed, but alſo of themſelves make a ſenſible hiſſing, if you lay your ear near to them, by reaſon of the motion of the vitall ſpirit ruſhing with great violence through the ſtraitneſs of the paſſage.

Wherefore in *Aneuriſmaes* in which there is a great rupture of the Artery, ſuch a noiſe is not heard, becauſe the ſpirit is carryed through a larger paſſage. Great *Aneuriſmaes* under the Arm pits, in the Groins and other partt wherein there are large veſſels, admit no cure, becauſe ſo great an eruption of blood and ſpirit often follows upon ſuch an inciſion, that death prevents both Art and Cure. Which I obſerved a few years ago in a certain Prieſt of Saint *Andrews* of the Arches, Mr. *John Maillet*, dwelling with a chief Preſident *Chriſtopher de Thou*. Who having an *Aneuriſma* at the ſetting on of the ſhoulder about the bigneſs of a Wall-nut, I charged him, he ſhould not let it be opened, for if he did it would bring him into manifeſt danger of his life, and that it would be more ſafe for him to break the violence thereof with double clothes ſteeped in the juyce of Night-ſhade & Houſleek, with new and wheyey cheeſe mixt therewith: Or with *Vnguentum de Bolo* or *Emplaſtrum contra ruptur am* and ſuch other refrigerating and aſtringent medicines, if he would lay upon it a thin plate of Lead, and would uſe ſhorter breeches that his doublet might ſerve to hold it too, to which he might faſten his breeches in ſtead of a ſwath, & in the mean time he ſhould eſchew all things which attenuate and inflame the blood, but eſpecially he ſhould keep himſelf from all great ſtraining of his voice. Although he had uſed his diet for a yeer, yet he could not ſo handle the matter but that the tumor increaſed, which he obſerving goes to a Barber, who ſuppoſing the tumor to be of the kind of vulgar impoſtumes, applies to it in the Evening a Cauſtick cauſing an Eſchar ſo to open it. In the Morning ſuch an abundance of blood flowed forth from the tumor being opened, that he therewith aſtoniſhed, implores all poſſible ayd, and bids that I ſhould be called to ſtay this ſo great bleeding, and he repented that he had not followed my directions. Wherefore I am called, but when I was ſcarce over the threſhold, he gave up his ghoſt with his blood. Wherefore I diligently admoniſh the young Chirurgeon that he do not raſhly open *Aneuriſmaes* unleſs they be ſmal in an ignoble part, and not indued with large veſſels, but rather let him perform the cure after this manner. Cut the skin which lyes over it untill the Artery appear, and then ſeparate it with your knife from the particles about it, then thruſt a blunt and crooked needle with a thred in it under it, bind it, then cut it off and ſo expect the falling off of the thred of it ſelf whiles nature covers the orifices of the cut Artery with new fleſh, then the reſidue of the cure may be performed after the manner of ſimple wounds. The *Aneuriſmaes* which happen in the internall parts are incurable. Such as frequently happen to thoſe who have often had the unction and ſweat for the cure of the French diſeaſe, becauſe the blood being ſo attenuated and heated therewith that it cannot be contained in the receptacles of the Artery, it diſtends it to that largneſs as to hold a mans Fiſt; Which I have obſerved in the dead body of a certain Taylor, who by an *Aneuriſma* of the Arterious vein ſuddenly whilſt he was playing at Tennis fell down dead, the veſſel being broken: his body being opened I found a great quantity of blood powred forth into the capacity of the Cheſt, but the body of the Artery was dilated to that largneſs I formerly mentioned, and the inner coat thereof was bony. For which cauſe within a while after I ſhewed it to the great admiration of the beholders in the Phyſitians School whilſt I publiquely diſſected a body there; the whilſt he lived ſaid he felt a beating and a great heat over all his body by the force of the pulſation of all the Arteries, by occaſion whereof he often ſwounded. Doctor *Sylvius* the Kings profeſſor of Phyſick at that time forbad him the uſe of Wine, and wiſhed him to uſe boyled water for his drink, and Curds and new Cheeſes for his meat, and to apply them in form of Cataplaſms upon the grieved and ſwoln part. At night he uſed a ptiſan of Barly meal and Poppy-ſeeds, and was purged now and then with a Clyſter of refrigerating and emollient things, or with Caſſia alone, by which medicines he ſaid he found himſelf much better. The cauſe of ſuch a bony conſtitution of the Arteries by *Aneuriſmaes* is, for that the hot and fervid blood firſt dilates the Coats of an Artery, then breaks them; which when it happens, it then borrows from the neighbouring bodies a fit matter to reſtore the looſed continuity thereof.

This matter whilſt by little and little it is dryed and hardened, it degenerates into a griſtly or elſe a bony ſubſtance, juſt by the force of the ſame materiall and efficient cauſes, by which ſtones are generated in the reins and bladder. For the more terreſtriall portion of the blood is dryed and condenſed by the power of the unnaturall heat contained in the part affected with an *Aneuriſma*; whereby it comes to paſs that the ſubſtance added to the dilated and broken Artery is turned into a body of a bony conſiſtence. In which the ſingular providence of nature, the handmaid of God is ſhewed, as that which, as it were by making and oppoſing a new wall or bank, would hinder and break the violence of the raging blood ſwelling with the abundance of the vitall ſpirits; unleſs any had rather to refer the cauſe of that hardneſs to the continuall application of refrigerating and aſtringent medicines

Prognoſtick.

A Hiſtory.

Aneuriſmaes muſt not raſhly be opened.

How they muſt be cured.

Theſe of the inward parts incurable.

A Hiſtory.

Lib. 4. Cap. ult. de præs. ex pulsu.
A Caution in the knowing of *Aneurismaes.*

medicines. Which have power to condensate and harden, as may not obscurely be gathered by the writings of *Galen*. But beware you be not deceived by the forementioned signs; for sometimes in large *Aneurismaes* you can perceive no pulsation, neither can you force the blood into the Artery by the pressure of your fingers, either because the quantity of such blood is greater than which can be contained in the ancient receptacles of the Artery, or because it is condensate and concrete into clods, whereupon wanting the benefit of ventilation from the heart, it presently putrefies; Thence ensue great pain, a Gangren, and mortification of the part, and lastly the death of the Creature.

The End of the Seventh Book.

OF PARTICULAR *TUMORS* AGAINST NATURE.

THE EIGHT BOOK.

The Preface.

BEcause the Cure of diseases must be varied according to the variety of the temper, not only of the body in generall, but also of each part thereof; the strength, figure, form, site, and sense thereof being taken into consideration: I think it worth my pains, having already spoken of Tumors in generall, if I shall treat of them in particular which affect each part of the body, beginning with those which assail the head. Therefore the Tumor either affects the whole head, or else only some particle thereof, as the Eyes, Ears, Nose, Gums and the like. Let the *Hydrocephalos*, and *Physocephalos* be examples of those tumors which possess the whole head.

CHAP. I.

Of an Hydrocephalos *or watry tumor which commonly affects the heads of Infants.*

What it is.

The causes.

THe Greeks call this disease *Hydrocephalos*, as it were a Dropsie of the Head, by a waterish humor; being a disease almost peculiar to Infants newly born. It hath for an externall cause the violent compression of the head by the hand of the Midwife or otherwise at the birth, or by a fall, contusion and the like. For hence comes a breaking of a vein, or Artery, and an effusion of the blood under the skin. Which by corruption becoming whayish, lastly degenerateth into a certain waterish humor. It hath also an inward cause, which is the aboundance of serous and acrid blood, which by its tenuity and heat sweats through the pores of the vessels, sometimes between the Musculous skin of the head and the *Pericranium*, sometimes between the *Pericranium* and the skull, and sometimes between the skull and the membrane called *Dura mater*, and otherwhiles in the ventricles of the brain.

Differences by reason of place.

The

The signs of it, contained in the space between the Musculous skin and the *Pericranium*, are a manifest tumor without pain, soft, and much yeelding to the pressure of the fingers. The Signs when it remaineth between the *Pericranium* and the skull, are for the most part like the forenamed, unless it be that the Tumor is a little harder, and not so yeelding to the finger, by reason of the parts between it and the finger; And also there is somewhat more sense of pain. But when it is in the space between the skull and *Dura mater*, or in the ventricles of the Brain or the whole substance thereof, there is a dulness of the senses as of the sight and hearing; the tumor doth not yeeld to the touch, unless you use strong impression, for then it imketh somewhat down, especially in infants newly born; who have their skulls almost as soft as waxe, and the junctures of their Sutures laxe, both by nature, as also by accident, by reason of the humor contained therein moistening and relaxing all the adjacent parts; the humor contained here lifts up the skull somewhat more high, especially at the meetings of the Sutures, which you may thus know, because the Tumor being pressed, the humor flies back into the secret passage of the Brain. Signs.

To conclude, the pain is more vehement, the whole head more swollen, the forehead stands somewhat further out, the eye is fixt and immoveable, and also weeps by reason of the serous humor sweating out of the brain.

Vesalius writes that he saw a girl of two yeers old, whose head was thicker than any mans head by this kind of Tumor, and the skull not bony, but membranous, as it useth to be in abortive births, and that there was nine pound of water ran out of it. A History.

Abucrasis tels that he saw a child whose head grew every day bigger by reason of the watery moisture contained therein, till at length the tumor became so great, that his neck could not bear it neither standing nor sitting, so that he died in a short time. I have observed and had in cure four children troubled with this disease, one of which being dissected after it died, had a brain no bigger than a Tennis Ball. But of a Tumor and humor contained within under the *Cranium*, or Skull, I have seen none recover, but they are easily healed of an externall Tumor.

Therefore whether the humor lye under the *Pericranium*, or under the musculous skin of the head, it must first be assayled with resolving medicines, but if it cannot be thus overcome, you must make an incision, taking heed of the Temporall Muscle, and thence press out all the humor, whether it resemble the washing of flesh newly killed, or blackish blood, or congealed or knotted blood, as when the tumor hath been caused by contusion; then the wound must be filled with dry lint, and covered with double boulsters, and lastly, bound with a fitting ligature.

CHAP. II.

Of a Polypus *being an eating disease in the Nose.*

THe *Polypus* is a Tumor of the Nose against nature, commonly arising from the *Os Ethmoides* or spongy bone. It is so called, because it resembles the feet of a Sea *Polypus* in figure, and the flesh thereof in consistences This Tumor stops the Nose, intercepting and hindering the liberty of speaking and blowing the Nose. *Celsus* saith the *Polypus* is a caruncle of excrescence one while white, another while reddish, which adheres to the bone of the Nose, and sometimes fills the Nostrils hanging towards the lips, sometimes it descends back through that hole, by which the spirit descends from the Nose to the throttle; it grows so that it may bee seen behind the *Vvulva*, and often strangles a man by stopping his breath. There are five kinds thereof, the first is, a soft membrane, long and thin like the relaxed and depressed *Vvulva*, hanging from the middle gristle of the nose, being filled with a Phlegmatick and viscid humor. This in exspiration hangs out of the nose, but is drawn in and hid by inspiration; it makes one snaffle in their speech and snort in their sleep. The second hath hard flesh, bred of Melancholy blood without adustion, which obstructing the nostrils intercepts the respiration made by that part. The third, is flesh hanging from the Gristle, round, and soft, being the off-spring of Phlegmatick blood. The fourth is an hard Tumor, like flesh, which when it is touched yeelds a sound like a stone; it is generated of Melancholy blood dryed, being somewhat of the nature of a *Scirrhus* confirmed and without pain. The reason of the name. *Lib.6.Cap.8.* The differences hereof

The fifth is as it were composed of many cancrous ulcers spred over the transverse surface of the gristle.

Of all these sorts of *Polypi* some are not ulcerated, others ulcerated, which send forth a stinking and strong smelling fileh. Such of them as are painfull, hard, resisting, and which have a livid, or leaden color, must not be touched with the hand, because they savour of the Nature of a *Cancer*, as into which they oft degenerate; yet by reason of the pain which oppresses more violently, you may use the Anodyne medicines formerly described in a *Cancer*, such as this following. Which of them admit no manuall operation.

℞ *Olei de vitell. ovorum* ℥ ii, *Lytharg. auri, & Tuthiæ præp. an.* ℥ i, *succi plat. solani an.* ℥ i ß, *Lapid. hæmatit. & camphoræ, an.* ℥ ß. Let them be wrought a long time in a leaden mortar, and so make a medicine to be put into the nostrills. Those which are soft, loose and without An Anodyne.

out

out pain, are ſometimes curable, being plucked away with an inſtrument made for that purpoſe, or elſe waſted by actuall cauteries put in through a pipe, ſo that they touch not the ſound part; or by potentiall cauteries, as *Egyptiacum* compoſed of equall parts of all the ſimples with vitrioll which hath a faculty to waſte ſuch like fleſh. *Aqua fortis* and oyl of vitrioll have the ſame faculty, for theſe take away a *Polypus* by the roots; for if any part thereof remain it will breed again. But Cauteries and acrid medicines muſt be put into the noſtrills with this Caution, that in the mean time cold repelling and aſtringent medicines be applyed to the noſe and parts about it to aſſwage the pain, and hinder the inflammation. Such as are *Vnguentum de bolo*, and *Vnguentum nutritum*, whites of Eggs beat with Roſe leaves, and many other things of the like nature.

Why it muſt be taken clear away.

CHAP. III.

Of the Parotides, *that is, Certain ſwellings about the Ears.*

What it is.

THe *Parotis* is a Tumor againſt nature, affecting the Glandules and thoſe parts ſeated behind and about the Ears, which are called the Emunctories of the brain; for theſe becauſe they are looſe and ſpongy, are fit to receive the excrements thereof. Of theſe ſome are criticall, the matter of the diſeaſe ſomewhat digeſted being ſent thither by the force of nature Others Symptomaticall, the excrements of the brain increaſed in quantity or quality ruſhing thither of their own accord. Such abſceſſes often have great inflammation joyned with them, becauſe the biting humor which flows thither is more vitiated in quality than in quantity. Beſides alſo they often cauſe great pain, by reaſon of the diſtention of the parts indued with moſt exquiſite ſenſe, as alſo by reaſon of a Nerve of the fifth Conjugation ſpred over theſe parts; as alſo of the neighbouring membranes of the brain, by which means the patient is troubled with the Head-ach and all his face becomes ſwoln. Yet many times this kind of Tumor uſeth to be raiſed by a tough, viſcous, and groſs humor.

The differences. Their ſigns and Symptomes.

Prognoſtick.

This diſeaſe doth more grievouſly afflict young men than old; it commonly brings a Feaver and watching. It is difficult to be cured, eſpecially when it is cauſed by a groſs, tough, and viſcid humor, ſent thither by the *Criſis*.

The cure. *Lib. 3. de comp. med. ſec. Locos. Hip. aph. 21. lib. 1.*

The cure muſt be performed by diet, which muſt be contrary to the quality of the humor in the temper and conſiſtence of the meats. If the inflammation and redneſs be great, which indicate aboundance of blood, Phlebotomy will be profitable, yea very neceſſary. But here we muſt not uſe the like judgment in application of locall medicines as we do in other tumors, as *Galen* admoniſheth us; that is, we muſt not uſe repercuſſives at the beginning, eſpecially if the abſceſs be criticall; for ſo we ſhould infringe or foreſlow the indeavors of nature forcibly freeing it ſelf from the morbifique matter. But we muſt much leſs repell or drive it back if the matter which hath flowed thither be venenate, for ſo the reflow thereof to the noble parts would prove mortall. Wherefore the Chirurgeon ſhall rather aſſiſt nature in attracting and drawing forth that humor. Yet if the defluxion ſhall be ſo violent, if the pain ſo fierce that thence there may be fear of watchings and a Feaver, which may deject the powers, *Galen* thinks it will be expedient with many reſolving medicines to mix ſome repelling. Wherefore at the beginning let ſuch a Cataplaſm be applyed.

Gentle reſolving medicines.

℞. *Far. hord. & ſem. lin. ana* ℥ ij, *coquantur cum mulſo aut decoctο cham. addendo but. recen. & olei cham. ana* ℥ i, *fiat cataplaſma.* And the following oyntment will alſo be good.

℞. *But. recen.* ℥ ij, *olei cham. & lilior. an.* ℥ i, *unguen. de Althea* ℥ ß, *ceræ parum:* make an oyntment to be applyed with moiſt and greaſie wooll, to mitigate the pain: alſo ſomewhat more ſtrong diſcuſſing and reſolving medicines will be profitable, as:

Stronger reſolvers.

℞. *Rad. Althææ & bryon. an.* ℥ ij, *fol. rutæ, puleg. orig. an. m. j, flo. cham. an. melil. an. p. j, coquantur in hydromelite, piſtentur, trajiciantur, addendo farin. ſænugræc. orobi. an.* ℥ i, *pul. Ireos, cham. melilot. an.* ℥ ij, *olei aneth. rutac. an.* ℥ i, *fiat cataplaſma.* But if you determine to reſolve it any more, you may uſe *Emplaſtrum Oxycroceum & Melilot-Plaiſter.* If the humor doth there concrete and grow hard, you muſt betake you to the medicines which were preſcribed in the Chapter of the *Scirrhus*; but if it tend to ſuppuration, you ſhall apply the following medicine.

A Ripening medicine.

℞. *Rad. liliorum & ceparum ſub cineribus coct. an.* ℥ iij, *Vitell. ovor. num. ij. axung. ſuillæ & unguent. baſilicon, an.* ℥ i, *farr. ſem. lini* ℥ i ß, *fiat Cataplaſma.* But if the matter do ſo require, let the tumor be opened as we have formerly preſcribed.

CHAP. IIII.

Of the Epulis, *or overgrowing of the flesh of the Gums.*

THe *Epulis* is a fleshy excrescence of the Gums between the teeth, which is by little and little oft-times encreased to the bigness of an Egge, so that it both hinders the speech and eating; it casts forth salvious and stinking filth, and not seldome degenerates into a *Cancer*, which you may understand by the propriety of the colour, pain and other accidents; for then you must by no means touch it with your hand. But that which doth not torment the Patient with pain, may be pluckt away; and let this be the manner thereof. What it is. The Symptomes.

Let it be tyed with a double thred, which must be straiter twitched untill such time as it fall off; when it shall fall away, the place must be burnt with a cautery put through a trunk or pipe, or with *Aqua fortis*, or oyl of *Vitriol*, but with great care that the sound parts adjoyning thereto be not hurt, for if so be that it be not burnt, it usually returns. The Chirurgecall cure.

I have often by this means taken away such large tumors of this kind, that they hung out of the mouth in no small bigness, to the great disfiguring of the face, which when as no Chirurgeon durst touch, because the flesh looked livid, I ventured upon because they were free from pain; and by taking them away and cauterizing the place, I perfectly healed them; not truly sodainly, and at once; for although I burnt the place after dissection; yet nevertheless they sprung up again, because a certain portion of the bone and sockets in which the Teeth stand fastened, were become rotten. I have often observed such like flesh by continuance of time to have turned into a gristly and bony substance. Wherefore the cure must be begun as speedily as may be; for being but little, and having fastened no deep roots, it is more easily taken away, being then only filled with a viscid humor, which in succes of time is hardered, and makes the taking away thereof more difficult. Why the cure must not be deferred.

CHAP. V.

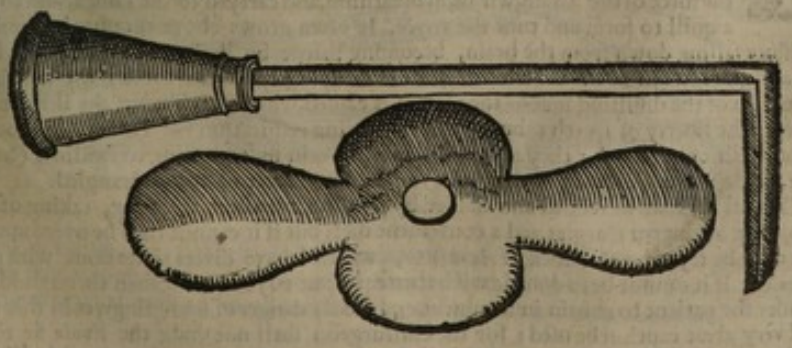
Of the Ranula.

THere is oft-times a tumor under the tongue, which takes away the liberty of pronuntiation or speech; wherefore the Greeks call it *Batrachium*, the Latins *Ranula*, because such as have this disease of the tongue, seem to expres their minds by croaking rather than by speaking. The Reason why it is so called.

It is caused by the falling down of a cold, moist, gross, tough, viscid and phlegmatick matter, from the brain upon the tongue, which matter in colour and consistence resembles the white of an egge, yet sometimes it looks of a citrin or yellowish colour. The Cause.

That you may safely perform the cure, you must open the Tumor rather with a cautery of hot Iron, than with a Knife, for otherwise it wil return again. The manner of opening of it must be thus. You shall get a bended hollow and perforated iron plate with a hole in the midst, and making the Patient to hold open his mouth, you shall so fit it, that the hole may be upon the part which must be opened. Then there you must open it with an hot Iron, for so you shall hurt no part of the mouth which is whole; but when you are ready to burn it, by thrusting your thumb under the Patients Chin, you may somewhat elevate the Tumor whereby you may open it with more certainty; when it is opened you must thrust out the matter contained therein, and then wash the Patients mouth with some barly water, hony, and Sugar of Roses; for so the ulcer will be safely and quickly healed. The Cure.

The delineation of the Iron plate and crooked actuall Cautery.



CHAP. VI.

Of the swelling of the Glandules, or Almonds of the throat.

Why the Glandules are called Almonds. Their use.

NAture at the jaws near the roots of the Tongue, hath placed two Glandules opposite to one another; in figure and magnitude like to Almonds, whence also they have their name; their office is to receive the spittle falling down from the brain, both lest that the too violent falling down of the humor should hinder the tongue in speaking, as also that the tongue might alwayes have moisture, as it were laid up in store, lest by continuall speaking, it should grow dry and fail. For thus this spittle being consumed by feaverish heats, the Patients are scarse able to speak, unless they first moisten their tongue by much washing of their mouth.

The Cause of their tumor.

These Glandules because they are seated in a hot and moist place, are very subject to inflammations; for there flows into these oft-times together with the blood, a great quantity of crude, phlegmatick and viscous humors, whence arises a tumor; which is not seldome occasioned by drinking much and that vaporous wine, by too much Gluttony, and staying abroad in the open air.

Symptomes.

Swallowing is painfull and troublesome to the Patient, and commonly he hath a Feaver. Oft-times the neighbouring Muscles of the throttle and neck are so swoln together with these Glandules, (that as it usually happens in the *Squinzy*) the passage of the breath and air is stopped, and the Patient strangled.

Cure.

We resist this imminent danger by purging and blood-letting, by applying Cupping-Glasses to the Neck and shoulders, by frictions and ligatures of the extreme parts, and by washing and gargling the mouth and throat with astringent Gargarisms. But if they come to suppuration, you must with your incision Knife make way for the evacuation of the *Pus*, or Matter; but if on the contrary, these things performed according to art, defluxion be increased, and there is present danger of death by stopping and intercepting the breath, for the shunning so great and imminent danger, the top or upper part of the *Aspera arteria*, or Weazon must be opened, in that place where it uses to stand most out; and it may be done so much the safer, because the jugular veins, and arteries are furthest distant from this place, and for that this place hath commonly little flesh upon it. And that the incision may be the fitlier made, the Patient must be wished to bend his head back, that so the Artery be the more easily come to by the instrument; then you shall make an incision overthwart way with a crooked knife between two rings (not hurting nor touching the gristly substance) that is to say, the membrane which tyes together the gristly rings being only cut; you shall then judg that you have made the incision large enough, when you shall perceive the breath to break out by the wound; the wound must be kept open so long, untill the danger of suffocation be past; and then it must be sowed up not touching the gristle: But if the lips of the wound shall be hard and callous; they must be lightly scarified, that so they may become bloody for their easier agglutination and union, as we shall shew more at large in the cure of Hare lips. I have had many in cure, who have recovered, that have had their Weazon together with the gristly rings thereof cut with a great wound, as we shall note when we shall come to treat of the cure of the wounds of that part.

Extreme diseases must have extreme remedies.

How you must open the Weazon.

CHAP. VII.

Of the inflammation and relaxation in the Vvula *or* Columella.

What the *Vvula* is, and what the use thereof.

THe *Vvula* is a little body, spongy and somewhat sharpened to the form of a Pine apple, hanging even down from the upper and inner part of the palat, so to break the force of the Air drawn in, in breathing, and carryed to the Lungs, and to be as a quill to form and tune the voyce. It often grows above measure by receiving moisture falling down from the brain, becoming sharpe by little and little from a broader and more swoln *Basis*. Which thing causes many Symptomes; for by the continuall irritation of the distilling humor the Cough is caused, which also hinders the sleep and intercepts the liberty of speech; but also by hindering respiration the Patients cannot sleep unless with open mouth: they are exercised with a vain indeavouring to swallow (having as it were a morsell sticking in their jaws) and are in danger of being strangled.

The Cause of the swelling thereof.

Symptomes.

The Cure.

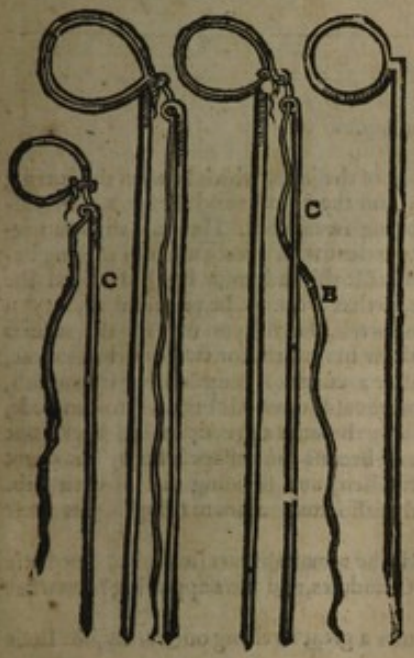
This disease must be resisted and assailed by purging, bleeding, Cupping, taking of clysters, using astringent Gargles, and a convenient diet; but if it cannot thus be overcome, the cure must be tryed by a caustick of *Aqua fortis*, which I have divers times done with good succes. But if it cannot be so done, it wil be better to put to your hand, than through idlenes to suffer the patient to remain in imminent and deadly danger of strangling; yet in this there must very great caution be used; for the Chirurgeon shall not judg the *Vvula* fit to be touched with an instrument or caustick, which is swoln with much inflamed, or black blood after the manner of a *Cancer*; but he shall boldly put to his hand if it be longish, grow

The cure by Chirurgery.

small

ſmall by little and little into a ſharpe, loose and ſoft point; if it be neither exceeding red, neither ſwolne with too much blood, but whitiſh and without pain. Therefore that you may more eaſily and ſafely cut away, that which redounds and is ſuperfluous, deſire the Patient to ſit in a light place, and hold his mouth open; then take hold of the top of the *Vvula* with your fizers, & cut away as much thereof as ſhall be thought unprofitable. Otherwiſe you ſhall bind it with the inſtrument here-under deſcribed; the invention of this inſtrument is to be aſcribed to *Honoratus Taſtellanus* that diligent and learned man, the Kings Phyſitian ordinary, and the chief Phyſitan of the Queen mother; Which alſo may be uſe in binding of *Polypi* and warts in the neck of the womb.

The Delineation of conſtrictory rings fit to twitch, or bind the Columella, *with a twiſted thred.*

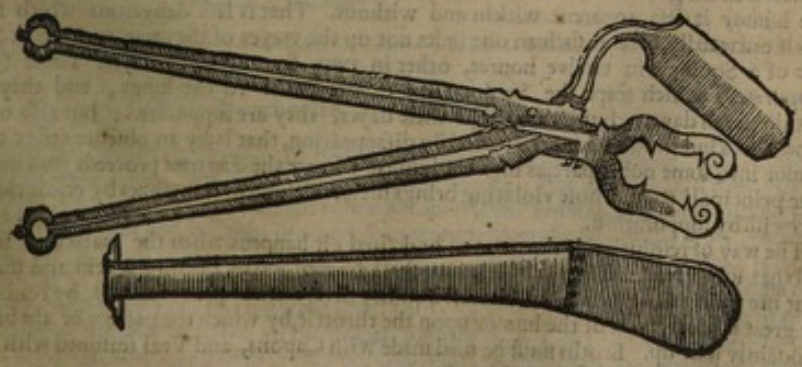


A. Shews the ring whoſe upper part is ſomewhat hollow.

B. A double waxed thred, which is couched in the hollowneſs of the ring, and hath a running, or looſe koot upon it.

An iron rod, into the eye whereof the forementioned double thred is put, and it is to twitch the *Columella* when as much thereof is taken hold of, as is unprofitable, and ſo to take it away without any flux of blood. When you would ſtraiten the thred, draw it again through this iron rod, and ſo ſtrain it as much as you ſhall think good, letting the end of the thred, hang out of the mouth. But every day it muſt be twitched harder than other, untill it fall away by means thereof, and ſo the part and patient be reſtored to health. I have delineated three of theſe inſtruments, that you may uſe which you will, as occaſion ſhall be offered.

A Figure of the Speculum oris, *by which the mouth is held and kept open whilſt the Chirurgeon is buſied in the cutting away or binding the* Vvula.



But if an eating ulcer ſhall aſſociate this relaxation of the *Vvula*, together with a flux of blood, then it muſt be burnt and ſeared with an hot iron, ſo thruſt into a Trunk, or Pipe with an hole in it, that ſo no ſound part of the mouth may be offended therewith.

A hollow Trunk with a hole in the ſide, with the hot iron inſerted, or put therein.

CHAP. VIII.

Of the Angina, *or Squinzy.*

What it is.

THe Squinancy, or Squincy, is a ſwelling of the jaws, which hinders the entring of the ambient air into the weazon, and the vapours and the ſpirit from paſſage forth, and the meat alſo from being ſwallowed. There are three differences thereof. The firſt torments the patient with great pain, no ſwelling being outwardly apparent, by reaſon the Morbifick humor lyes hid behind the almonds or Glandules at the *Vertebræ* of the neck, ſo that it cannot be perceived, unleſs you hold down the tongue with a ſpatula or the *Speculum oris*, for ſo you may ſee the redneſs and tumor there lying hid. The Patient cannot draw his breath, nor ſwallow down meat, nor drink; his tongue, (like a Gray-hounds after a courſe) hangs out of his mouth, and he holds his mouth open that ſo he may the more eaſily draw his breath; to conclude, his voyce is as it were drownd in his jaws and noſe; he cannot lye upon his back, but lying is forced to ſit, ſo to breath more freely: and becauſe the paſſage is ſtopt, the drink flies out at his noſe; the eyes are fiery and ſwollen, and ſtanding out of their orb. Thoſe which are thus affected are often ſodainly ſuffocated, a foam riſing about their mouths.

The differences.

The firſt kind.

The Symptoms.

The ſecond kind.

The ſecond difference is ſaid to be that, in which the tumor appears inwardly, but little or ſcarſe any thing at all outwardly, the tongue, Glandules, and jaws appearing ſomewhat ſwollen.

The third.

The third being leaſt dangerous of them all, cauſes a great ſwelling outwardly, but little inwardly.

The Cauſes.

The Cauſes are either internall, or externall. The externall are a ſtroak, ſplinter or the like thing ſticking in the Throat, or the exceſs of extreme cold, or heat. The internall cauſes are a more plentifull defluxion of the humors either from the whole body of the brain, which participate of the nature either of blood, choler or flegm, but ſeldome of Melancholy. The ſigns by which the kind and commixture may be known, have been declared in the generall treatiſe of tumors. The Squincy it more dangerous, by how much the humor is leſs apparent within and without. That is leſs dangerous which ſhews it ſelf outwardly, becauſe ſuch an one ſhuts not up the wayes of the meat, nor breath. Some dye of a Squincy in twelve houres, other in two, four or ſeven dayes. Thoſe (ſaith *Hippocrates*) which ſcape the Squincy, the diſeaſe paſſes to the lungs, and they dye within ſeven dayes; but if they ſcape theſe dayes, they are ſuppurated; but alſo oftentimes this kind of diſeaſe is terminated by diſappearing, that is, by an obſcure reflux of the humor into ſome noble part, as into the Lungs (whence the *Empyema* proceeds) and into other principall parts, whoſe violating brings inevitable death; ſometimes by reſolution, otherwiſe by ſuppuration.

Hip. ſect. 3. prog. 2. Aphor. 10 ſect. 5

The way of reſolution is the more to be deſired; it happens when the matter is ſmall, and that ſubtle, eſpecially if the Phyſitian ſhall draw blood by opening a vein, and the Patient uſe ſitting Gargariſms. A Criticall Squincy divers times proves deadly by reaſon of the great falling down of the humor upon the throttle, by which the paſſage of the breath is ſodainly ſhut up. Broths muſt be uſed made with Capons, and Veal ſeaſoned with Lettuce, Purſlain, Sorrell, and the cold ſeeds.

Diet.

If the Patient ſhall be ſomewhat weak, let him have potched Egges, and Barly Creams, the Barly being ſomewhat boyled with Raiſons in water and Sugar, and other meats of this kind. Let him be forbidden wine, in ſtead whereof he may uſe *Hydromelita*, and *Hydroſaccharo* that is, drinks made of water and Hony, or water and Sugar as alſo the Syrups of dryed Roſes, of Violets, Sorrell and Lemmons, and others of this kind. Let him avoid too much ſleep. But in the mean time the Phyſitian muſt be carefull of all, becauſe this diſeaſe

diſeaſe is of their kind, which brook no delayes. Wherefore let the *Baſilica* be preſently opened, on that ſide the tumor is the greater; then within a ſhort time after the ſame day, for evacuation of the conjunct matter, let the vein under the tongue be opened; let cupping-Glaſſes be applyed, ſometimes with ſcarification, ſometimes without, to the neck and ſhoulders, and let frictions and painfull ligatures be uſed to the extreme parts. But let the humor impact in the part be drawn away by clyſters and ſharp ſuppoſitories. Whilſt the matter is in defluxion, let the mouth without delay be waſhed with aſtringent gargariſmes to hinder the defluxion of the humor, leſt by its ſodain falling down it kill the Patient, as it often happens, all the Phyſitians care and diligence notwithſtanding. Therefore let the mouth be frequently waſhed with Oxycrate, or ſuch a gargariſm: R. *Pomorum ſilveſt. nu.* iiij, *ſumach, Roſar. rub. an. m. ſſ. berber.* ʒ ij, let them be all boyled with ſufficient quantity of water to the conſumption of the half, adding thereunto of the wine of ſoure Pomgranats, ʒ iiij, of *Diamoron* ʒ ij, let it be a little more boyled and make a gargle according to Art. And there may be other Gargariſms made of the waters of Plantain, Night-ſhade, Verjuice, Julep of Roſes and the like. But if the matter of the defluxion ſhall be Phlegmatick, Alum, Pomgranat pill, Cypreſs nuts, and a little Vineger may be ſafely added. But on the contrary, repercuſſives muſt not be outwardly applyed, but rather Lenities, whereby the externall parts may be relaxed and rarified, and ſo the way be open either for the diffuſing or reſolving the portion of the humor. You ſhall know the humor to begin to be reſolved, if the Feaver leave the Patient, if he ſwallow, ſpeak and breath more freely, if he ſleep quietly, and the pain begin to be much aſſwaged. Therefore then natures endeavour muſt be helped by applying reſolved medicines, or elſe by uſing ſuppuratives inwardly and outwardly, if the matter ſeem to turn into *Pus*. Therefore let gargariſms be made of the roots of March-Mallows, Figs, Jujubes, damask Prunes, Dates, perfectly boyled in water. The like benefit may be had by Gargariſms of Cows milk with Sugar, by oyl of ſweet Almonds, or Violets warm, for ſuch things help forward ſuppuration and aſſwage pain; let ſuppurating cataplaſms be applyed outwardly to the neck and throat, and the parts be wrapped with wooll moiſtened with oyl of Lillies. When the Phyſitian ſhall perceive that the humor is perfectly turned into *pus*, let the patients mouth be opened with the *Speculum oris*, and the abſceſs opened with a crooked and long inciſion knife; then let the mouth be now and then waſhed with cleanſing gargles; as R. *Aquæ hordei lib. ſſ. mellis roſ. & ſyr. roſar. ſic. an.* ʒ i, *fiat gargariſma*. Alſo the uſe of *ænomel*, that is, wine and Hony, will be fit for this purpoſe. The ulcer being cleanſed by theſe means, let it be cicatrized with a little roch-Alum added to the former gargariſms.

Cure.

Repelling Gargariſms.

Ripening Gargariſms.

Detergent Gargariſms.

The Figure of an inciſion knife opened out of the haft, which ſerves for a ſheath thereto.

CHAP. IX.

Of the Bronchocele, *or* Rupture *of the throat.*

THat which the French call *Goetra*, that the Greeks call *Bronchocele*, the Latins *Gutturis Hernia*, that is, the Rupture of the throat. For it is a round tumor of the throat, the matter whereof coming from within outwards, is contained between the skin and weazon; it proceeds in women from the ſame cauſe as an *Aneuriſma*.

The reaſon of the name.

But this generall name of *Bronchocele* undergoes many differences; for ſometimes it retains the nature of *Melicerides*, other whiles of *Steatoma's*, *Atheroma's* or *Aneuriſma's*, in ſome there is found a fleſhy ſubſtance having ſome ſmall pain; ſome of theſe are ſmall, others ſo great, that they ſeem almoſt to cover all the throat; ſome have a Ciſt, or bag, others have no ſuch thing; all how many ſo ever they be, and what end they ſhall have, may be known by their proper ſigns; theſe which ſhall be curable, may be opened with an actuall or potentiall cautery, or with an inciſion knife. Hence if it be poſſible, let the matter be preſently evacuated, but if it cannot be done at once, let it be performed at divers times, and diſcuſſed by fit remedies, and laſtly, let the ulcer be conſolidated and cicatrized.

The differences.

The Cures

CHAP. X.

Of the Pleuriſie.

What it is.

THe Pleuriſie is an inflammation of the membrane, inveſting the ribs, cauſed by ſubtile and cholerick blood, ſpringing upwards with great violence from the hollow vein into the *Azygos*, and thence into the intercoſtall veins, and is at length powred forth into the emptie ſpaces of the intercoſtall muſcles, and the mentioned membrane. Being contained there, if it tend to ſuppuration, it commonly infers a pricking pain, a Feaver and difficulty of breathing. This ſuppurated blood is purged and evacuated one while by the mouth; the Lungs ſucking it, and ſo caſting it into the Weazon, and ſo into the mouth, otherwhiles by urine, and ſometimes by ſtool.

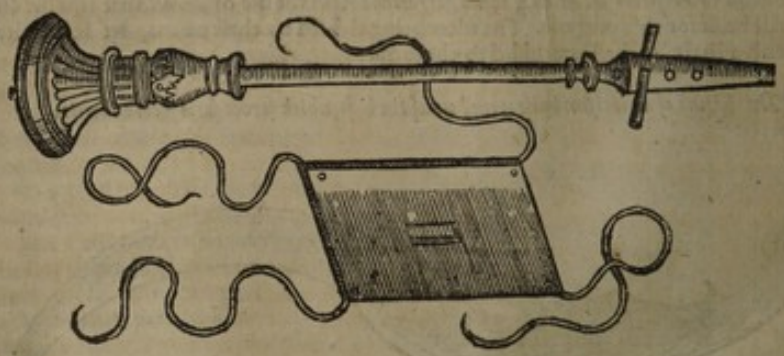
Of a Pleuriſie coming to ſuppuration.

Of the change thereof into an *Empyema*.

But. if nature being too weak, cannot expectorate the purulent blood poured forth into the capacity of the cheſt, the diſeaſe is turned into an *Empyema*, wherefore the Chirurgeon muſt then be called, who beginning to reckon from below upwards, may make a vent between the third and fourth true and legitimate ribs; and that muſt be done either with an actual or potentiall cautery, or with a ſharpe knife drawn upwards, towards the back, but not downwards, leſt the veſſels ſhould be violated which are diſſeminated under the rib. This apertion may be ſafely and eaſily performed by this actuall cautery; it is perforated with four holes, through one whereof there is a pin put higher or lower according to the depth and manner of your inciſion: then the point thereof is thruſt through a plate of Iron perforated alſo in the midſt, into the part deſigned by the Phyſitian, leſt the wavering hand might peradventure touch, and ſo hurt the other parts not to be medled withall. This ſame plate muſt be ſomewhat hollowed, that ſo it might be more eaſily fitted to the gibbous ſide, and bound by the corners on the contrary ſide with four ſtrings. Wherefore I have thought good here to expreſs the figures thereof.

Of the aperition of the ſide in an *Empyema*.

The Figure of an actuall cautery with its plate fit to be uſed in a Pleuriſie.



But if the patient ſhall have a large body, Cheſt and ribs, you may divide and perforate the ribs themſelves with a Trepan; howſoever the apertion be made, the *pus* or matter muſt be evacuated by little and little at ſeverall times; and the capacity of the Cheſt cleanſed from the purulent matter by a detergent injection of vj ounces of Barley water, and ℥ ij. hony of Roſes, and other the like things mentioned at large in our cure of wounds.

CHAP. XI.

Of the Dropſie.

What the Dropſie is.

THe Dropſie is a Tumor againſt nature by the aboundance of wateriſh humor, of flatulencies, or Phlegm, gathered one while in all the habit of the body, otherwhiles in ſome part, and that eſpecially in the capacity of the belly between the *Peritoneum* and entrails. From this diſtinction of places and matters there ariſe divers kinds of Dropſies. Firſt, that Dropſie which fils that ſpace of the belly, is either moiſt or dry. The moiſt is called the *Aſcites*, by reaſon of the ſimilitude it hath with a leather bottle, or *Borachio*, becauſe the wateriſh humor is contained in that capacity, as it were in ſuch a veſſell.

The differences thereof.

The dry is called the *Tympanites*, or Tympany, by reaſon the belly ſwollen with wind ſounds like a *Tympanum*, that is, a Drum. But when the whole habit of the body is diſtended

with

with a phlegmatick humor,it is called *Anasarca* or *Leucophlegmatia*. In this last kind of Dropsie the lower parts first swell, as which by reason of their site are more subject to receive defluxions, and more remote from the fountain of the native heat; wherefore if you presse them down the print of your finger will remain sometime after;the patients face wil become pale and puffed up, whereby it may be distinguished from the two other kinds of Dropsie. For in them first the belly, then by a certain consequence the thighs and feet do swell. There are besides also particular Dropsies,contained in the strait bounds of certain places, such are the *Hydrocephalos* in the head; the *Bronchocele* in the throat; the *Pleurocele* in the Chest; the *Hydrocele* in the *Scrotum*, or Cod; and so of the rest. Yet they all arise from the same cause; that is, the weakness or defect of the altering or concocting faculties, especially of the liver,which hath been caused by a *Scirrhus*, or any kind of great distemper, chiefly cold, whether it happen primarily, or secondarily by reason of some hot distemper dissipating the native and inbred heat, such a Dropsie is uncurable;or else it comes by consent of some other higher or lower part;for if in the Lungs, Midriff,or Reins there be any distemper,or disease bred,it is easily communicated to the gibbous part of the Liver, by the branches of the hollow vein, which run thither. But if the mischief proceed from the Spleen, Stomach,Mesentery Guts,especially the *jejunum* and *Ileum*, it creeps into the hollow side of the liver by the meseraick veins,and other branches of the *Vena porta* or Gate vein. For thus such as are troubled with the *Asthma*,Ptisick,Spleen, Jaundise,and also the Phrensie,fall into a Dropsie.

The Symptoms.

The Causes.

How divers diseases turn into Dropsies.

Lastly,all such as have the menstruall or hæmorrhoidall blood suppressed or too immoderately flowing contrary to their custome, either overwhelms, diminisheth or extinguisheth the native heat; no otherwise than fire, which is suffocated by too great a quantity of wood ; or dieth and is extinguished for want thereof. We must look for the same from the excrements of the belly or bladder, cast forth either too sparingly or too immoderately : Or by too large quantity of meats too cold and rashly devoured without any order; To conclude,by every default of externall causes , through which occasion,error may happen in diet or exercise.

The *Ascites* is distinguished from the two other kinds of Dropsies, both by the magnitude of the efficient cause,as also by the violence of the Symptoms,as the dejected appetite, thirst,and sweling of the *Abdomen*. And also when the body is moved or turned upon either side,you may hear a sound as of the jogging of water in a vessell half full. Lastly, the humor is diversly driven upwards or downwards, according to the turning of the body and compression of the *Abdomen*; It also causeth various Symptoms by pressure of the parts to which it floweth. For it causeth difficulty of breathing and the cough by pressing the Midriffe; by sweating through into the capacity of the Chest it causeth like Symptoms as the *Empyema*. Besides also the patients often seem, as it were, by the ebbing and flowing of the wateriſh humor, one while to be carried to the skies , and another whiles to be drowned in the water, which I have learnt not by reading of any author, but by the report of the patients themselves. But if these wateriſh humors be fallen down to the lower parts, they suppress the excrements of the guts and bladder by pressing and straitning the passages. When the patient lies on his back the tumor seems lesse, because it is spread on both sides;On the contrary when he stands or sits, it seems greater,for that all the humor is forced or driven into the lower belly,whence he feels a heavinesse in the *Pecten* or share. The upper parts of the body fall away by defect of the blood fit for nourishment in quality and consistence,but the lower parts swel by the flowing down of the serous and wateriſh humor to them.The pulse is little,quick,and hard with tention.

The signs of an *Ascites*.

The Symptoms.

This disease is of the kind of Chronicall or long diseases;wherefore it is scarce,or never cured, especially in those who have it from their mothers womb, who have the Action of their stomach depraved,and those who are cachectick, old; and lastly, all such as have the naturall faculty languishing and faulty.

Prognostickt.

On the contrary, young and strong men,especially if they have no feaver,and finally all who can endure labour, and those exercises which are fit for curing this disease, easily recover,principally if they use a Physitian before the water which is gathered together do putrefie and infect the bowels by its contagion.

CHAP. XII.

Of the cure of the Dropsie.

THe beginning of the cure must be with gentle and mild medicines; neither must we come to a *Paracentesis* unless we have formely used and tried these. Therefore it shal be the part of the Physitian to prescribe a drying diet,and such medicines as carry away water, both by stool and urine. *Hippocrates* ordains this powder for Hydropick persons. ℞ *Cantharidum ablatis capitib. & alis* ʒß. *Comburantur in furno, & fiat pulvis*; of which administer two grains in white wine, for nature helped by this, and the like remedies hath not seldome been seen to have cured the Dropsie.

Hip. lib. 4 de acut. & lib. de intern.

But

But that we may haſten the cure, it will be available to ſtir up the native heat of the part by appplication of thoſe medicines which have a diſcuſſing force;as bags,baths,ointments,

Bags. and Emplaiſters. Let bags be made of dry and harſh Bran, Oats,Salt,Sulphur, being made hot, or for want of them,of Sander, or Aſhes often heated.

Bathes. The more effectuall baths are ſalt, nitrous, and ſulphurous waters, whether by nature or art, that is, prepared by the diſſolution of ſalt, niter, and Sulphur; to which if Rue, Marjorom, the leaves of Fennell, and tops of Dill, of *Starchas*, and the like be added,

Liniments. the buſineſs will goe better forwards. Let the ointments be made of the oyl of Rue, Dill, Baies, and Squills, in which ſome *Euphorbium*,Pellitory of *Spain*,or Pepper have been

Emplaiſters. boiled. Let plaiſters be made of Frankincenſe, Myrrh, Turpentine, *Coſtus*, Bayberries,

Veſicatories. Engliſh galengall, hony, the dung of Oxen,Pigeons, Goats, Horſes, and the like, which alſo may be applied by themſelves. If the diſeaſe continue,we muſt come to *Sinapiſmes* and *Pharmigmes*,that is, to rubrifying and veſicatory medicines. When the bliſters are raiſed,they muſt be anointed again,that ſo the water may by little and little flow ſo long untill all the humor be exhauſted, and the patient reſtored to health.

Gal. lib. de facul. natur. 1. *Galen* writes,the Husbandmen in *Aſia*, when they carried wheat out of the Country into the city in Cars,when they wil ſteal away and not be taken,hide ſome ſtone jugs fill'd with water in the midſt of the wheat; for that will draw the moiſture through the jugs into it ſelf, and encreaſe both the quantity and weight. When certain pragmaticall Phyſitians had read this,they thought that wheat had force to draw out the water, ſo that if any ſick of the Dropſie ſhould be buried in a heap of wheat,it would draw out all the water.

Divers opinions of *Paracenteſis*,or opening of the belly. But if the Phyſitian ſhall profit nothing by theſe means, he muſt come to the exquiſitly chief remedy,that is, to *Paracenteſis*. Of which becauſe the opinions of the ancient Phyſitians have been divers, we will produce and explain them.

Reaſons againſt it. Thoſe therefore which diſallow *Paracenteſis*, conclude it dangerous for three reaſons. The firſt is becauſe by pouring out the contained water, together with it,you diſſipate and reſolve the ſpirits, and conſequently the naturall, vitall, an d animall faculties. Another opinion is,becauſe the Liver wanting the water by which formerly it was born up;thence forward hanging down by its weight,depreſſeth and draweth downwards the midriffe and the whole Cheſt, whence a dry cough, and a difficulty of breathing proceed. The third is,becauſe the ſubſtance of the *Peritonæum*, as that which is nervous, cannot be pricked or cut without danger, neither can that which is pricked or cut be eaſily agglutinated and united, by reaſon of the ſpermatick and bloudleſſe nature thereof. *Eraſiſtratus* moved by theſe reaſons condemned *Paracenteſis* as deadly: alſo he perſwaded that it was unprofitable for theſe following reaſons, *viz.* becauſe the water powred forth, doth not take away with it the cauſe of the Dropſie,and the diſtemper and hardneſs of the Liver,and of the other bowels, whereby it comes to paſs that by breeding new waters they may eaſily again fall into the Dropſie. And then the feaver, thirſt,the hot and drie diſtemper of the bowels, all which were mitigated by the touch of the included water,are aggravated by the abſence thereof,being powred forth:which thing ſeemeth to have moved *Avicen* and *Gordonius* that he ſaid none; the other ſaid very few lived after the *Paracenteſis*:but the refutation of all ſuch reaſons is very eaſie.

Eraſiſtratus his Reaſons againſt it.

Reaſons for it. For, for the firſt *Galen* infers, that harmfull diſſipation of ſpirits, and reſolving the faculties happens,when the *Paracenteſis* is not diligently, and artificially performed. As in which the water is preſently powred forth; truly if that reaſon have any validity,Phlebomy muſt ſeem to be removed far from the number of wholſome remedies, as whereby the blood is poured forth, which hath far more pure and ſubtil ſpirits,than thoſe which are ſaid to be diffuſed and mixed with the Dropſie waters. But that danger which the ſecond reaſon threatens ſhall eaſily be avoided; the patient being deſired to lie upon his back in his bed, for ſo the Liver will not hang down. But for the third reaſon, the fear of pricking the *Peritonæum*,is childiſh:for thoſe evils which follow upon wounds of the nervous parts,happen by reaſon of the exquiſit ſenſe of the part,which in the *Peritonæum* ill affected & altered by the contained water,is either none or very ſmal.But reaſon and experience teach many nervous parts, alſo the very membranes themſelves being far removed from a fleſhy ſubſtance,being wounded admit cure;certainly much more the *Peritonæum*, as

Lib. 3. cap. 21. that which adheres ſo ſtraitly to the muſcles of the *Abdomen*,that the diſſector cannot ſeparate it from the fleſh,but with much labor.But the reaſon which ſeems to argue the unprofitableneſs of the *Paracenteſis* is refelled by the authority of *Celſus*.I,ſaith he, am not ignorant that *Eraſiſtratus* did not like *Paracenteſis*;for he thought the Dropſie to be a diſeaſe of the Liver, and ſo that it muſt be cured,and that the water was in vain let forth,which the Liver being vitiated,might grow again. But firſt this is not the fault of this bowel alone, and then although the water had his originall from the Liver,yet unleſs the water which ſtayeth there contrary to nature being evacuated,it hurteth both the Liver,and the reſt of the inner parts,whilſt it either encreaſeth their hardneſs,or at the leaſt keepeth it hard,and yet notwithſtanding it is fit the body be cured. And although the once letting forth of the humor profit nothing,yet it makes way for medicines, which while it was there contained,it hindered. But this ſerous,ſalt,and corrupt humor is ſo far from being able to

mitigate

mitigate a feaver and thirſt, that on the contrary it increaſeth them. And alſo it augmenteth the cold diſtemper, whilſt by its abundance it overwhelms and extinguiſheth the native heat. But the authority of *Celius Aurelianus* that moſt noble Phyſitian, though a Methodick, may ſatisfie *Avicen* and *Gordonius*. They, ſaith he, which dare avouch that all ſuch as have the water let out by opening their belly have died, do lie; for we have ſeen many recover by this kind of remedy: but if any died, it happened either by the default of the ſlow or negligent adminiſtration of the *Paracenteſis*. I will add this one thing which may take all error of controverſies: we unwiſely doubt of the remedy when the patient is brought to that neceſſity, that we can only help him by that means. Now muſt we ſhew how the belly ought to be opened. If the Dropſie happen by fault of the Liver, the ſection muſt be made on the left ſide; but if of the Spleen, in the right: for if the patient ſhould lie upon the ſide which is opened, the pain of the wound would continually trouble him, and the water running into that part where the ſection is, would continually drop, whence would follow a diſſolution of the faculties. The Section muſt be made three fingers bredth below the Navell, to wit, at the ſide of the right muſcle, but not upon that which they call the *Linea Alba*; neither upon the nervous parts of the reſt of the muſcles of the *Epigaſtrium*; that ſo we may prevent pain and difficulty of healing. Therefore we muſt have a care that the patient lie upon his right ſide, if the inciſion be made in the left, or on the left, if on the right. Then the Chirurgeon both with his own hand, as alſo with the hand of his ſervant aſſiſting him, muſt take up the skin of the belly, with the fleſhy pannicle lying under it, and ſeparate them from the reſt; then let him divide them ſo ſeparated with a Section even to the fleſh lying under them, which being done, let him force as much as hee can the divided skin upwards towards the ſtomach, that when the wound, which muſt preſently be made in the fleſh lying there-under, ſhall be conſolidated, the skin by its falling therein, may ſerve for that purpoſe: then therefore let him divide the muſculous fleſh and *Peritonæum* with a ſmall wound, not hurting the Call or Guts.

Lib. de morb. Ch. cap. de Hydrope.

The places of the apertion muſt be divers, according to the parts chiefly affected.

The manner of making apertion.

Then put into the wound a trunk, or golden, or ſilver crooked pipe, of the thickneſs of a Gooſes-quill, and of the length of ſome half a finger. Let that part of it which goes into the capacity of the belly have ſomething a broad head, and that perforated with two ſmall holes, by which a ſtring being faſtened, it may be bound ſo about the body, that it cannot be moved, unleſs at the Chirurgeons pleaſure. Let a ſpunge be put into the pipe, which may receive the dropping humor: and let it be taken out when you would evacuate the water: but let it not be poured out all together, but by little and little for fear of diſſipation of the ſpirits, and reſolution of the faculties, which I once ſaw happen to one ſick of the Dropſie. He being impatient of the diſeaſe and cure thereof, thruſt a Bodkin into his belly, and did much rejoice at the pouring forth of the water, as if he had been freed from the humor and the diſeaſe, but died within a few houres, becauſe the force of the water running forth, could by no means be ſtaied, for the inciſion was not artificially made. But it will not be ſufficient to have made way for the humor by the means aforementioned, but alſo the external orifice of the pipe muſt be ſtopped & ſtrengthned by double cloaths, and a ſtrong ligature, leſt any of the water flow forth againſt our wils. But we muſt note that the pipe is not to be drawn out of the wound, before as much water ſhall be iſſued forth as we deſire, and the tumor requireth; for once drawn forth, it cannot eaſily be put in again, and without force and pain be fitted to the lips of the wound, becauſe the skin and fleſhy pannicle cover it by their falling into the wound of the fleſh or muſcle. But whilſt the water is in evacuation, we muſt have a diligent care of feeding the patient, as alſo of his ſtrength, for if that fail, and he ſeem to be debilitated, the effuſion of the water muſt be ſtaied for ſome daies, which at the length performed acccording to our deſire, the wound muſt be ſo conſolidated that the Chirurgeon beware it degenerate not into a Fiſtula.

A Hiſtory.

A caution for taking out the pipe.

The figure of a Pipe in form of a Quill, to evacuate the water in Dropſies.

Others performe this buſineſs after another manner; for making an inciſion, they thruſt through the lips of the wound with a needle and thred: but they take up much of the fleſhie ſubſtance with the needle, leſt that which is taken up ſhould be rent and torn by the forcible drawing of the lips together. Then the thred it ſelf is wrapped up and down over both ends of the needle, ſo thruſt through, as is uſually done in a hare-lip, that ſo the lips of the wound may ſo cloſely cohere, that not a drop of water may get out againſt the Chirurgeons wil. Sometimes ſuch as are cured and healed of the Dropſie, fall into the Jaundiſe, whom I uſually cure after this maner. ℞ *ſterc. anſer.* ʒij, diſſolve it in ʒiij, *vini alb. coletur*: make a Potion, and let it be given two houres before meat.

Another manner of evacuating the water after the apertion.

A medicine for the Jaundiſe.

CHAP.

CHAP. XIII.

Of the tumor and relaxation of the Navell.

The divers cauſes thereof.

THe *Exomphalos* or ſwelling of the Navel, is cauſed by the *Peritoneum*, either relaxed or broken: for by this occaſion oft-times the guts, and oft-times the kal, fal into the ſeat of the Navell, and ſometimes ſuperfluous fleſh is there generated; otherwiſe this tumor is as an *Aneuriſma* by too great a quantity of bloud poured forth in that place: otherwiſe by a flatulent matter, and ſometimes by a wateriſh humor. If the humor be occaſioned by the kall, the part it ſelf will retain his proper colour, that is, the colour of the skin; the tumor will be ſoft and almoſt without pain, and which will reſide without noiſe, either by the preſſure of your fingirs, or of it ſelf when the Patient lieth on his back; but tumor cauſed by the guts, is more unequall, and when it is forced in by the preſſure of your fingers, there is ſuch a noiſe heard, as in the *Enterocele*; but if the tumor proceed of ſuperfluous fleſh it will be harder and more ſtubborn, not eaſily retiring into the body, although the patient lie upon his back, and you preſſe it with your fingers.

Signs hereof occaſioned by the kall.

By the guts.

By fleſh.

By wind.

By a wateriſh humor.

By bruiſed blood.

Which may be cured by Chirurgery, which not.

The cure by Chirurgery.

The tumor is ſofter which proceeds of wind, but which wil not retire into the body, & ſounds under your nail like a taber. If the ſwelling be cauſed by a wateriſh humor, it hath all things common with the flatuous tumor, except that it is not ſo viſible, and without noiſe. If it be from effuſion of blood, it is of a livid colour, but if the effuſed blood ſhall be arteriall, then there are the ſigns of an *Aneuriſma*. Wherefore when the tumor is cauſed by the guts, kall, wind or a wateriſh humor, it is cured by Chirurgery: but not if it proceed from a fleſhy excreſcence or ſuffuſion of blood. The tumor of the navell proceeding from the kall and guts, the Patient muſt lie upon his back to be cured, and then the kall, and guts, muſt with your fingers be forced into their due place: then the skin with which the tumor is circumſcribed muſt be taken up with your fingers, and thruſt through with a needle, drawing after it a double twined and ſtrong thred, then it muſt be ſcarified about the ſides, that ſo it may be the eaſier agglutinated. Then muſt it be thruſt through with a needle three or four times, according to the manner and condition of the diſtention and tumor. And ſo twitch it ſtrongly with a thred, that the skin which is ſo bound may at length fall off together with the ligatures. But alſo you may cut off the skin ſo diſtended even to the ligature, and then cicatrize it, as ſhall be fit. A flatulent tumor of the navell ſhall be cured with the ſame remedies, as we ſhall hereafter mention in the cure of a windy rupture, but the watery may be poured forth by making a ſmall inciſion. And the wound ſhall be kept open, ſo long, untill all the water be drained forth.

CHAP. XIIII.

Of the Tumors of the Groins and Cods called Herniæ, *that is, Ruptures.*

Theſe are only 3. ſorts of Rupture.

THe ancient Phyſicians have made many kinds of Ruptures, yet indeed there are only three to be called by that name, that is, the *Inteſtinalis*, or that of the guts, the *Zirbalis*, or that of the kall, and that which is mixed of them both. The other kinds of Ruptures have come into this order, rather by ſimilitude, than any truth of the thing: for in them the gut or kall doe not forſake their places.

Bubonocele. *Enterocele* and *Epiplocele.*

Hydrocele. *Phyſocele.*

Sarcocele. *Ciſocele.*

The Cauſes.

The Signs.

The Greeks have given to all theſe ſeverall names, both from the ſeat of the tumor, as alſo from their matter. For thus they have called an unperfect rupture which deſcends not beyond the Groins, nor falls down into the cods, *Bubonocele*: but the compleat which penetrates into the cod, if it be by falling down of the gut, *Enterocele*: if from the kall, *Epiplocele*: if from them both together, they name it *Enteroepiplocele*: but if the tumor proceed from a wateriſh humor, they term it *Hydrocele*: if from wind, *Phyſocele*; if from both, *Hydrophyſocele*; if a fleſhy excreſcence ſhall grow about the teſticle, or in the ſubſtance thereof, it is named *Sarcocele*. If the veins interwoven, and divaricated divers wayes ſhall be ſwoln in the cod and teſticles, the tumor obtains the name of a *Ciſocele*. But if the humors ſhall be ſhut up or ſent thither, the name is impoſed upon the tumor, from the predominant humor, as we have noted in the beginning of our Tractate of Tumors. The cauſes are many, as all too violent motions, a ſtroak, a fall from a high place, vomiting, a cough, leaping, riding upon a trotting horſe, the ſounding of trumpets, or ſackbuts, the carrying, or lifting up of a heavy burden, racking, alſo the too immoderate uſe of viſcid and flatulent meats; for all ſuch things may either relax or break the *Peritoneum*, as that which is a thin and extended membrane. The ſigns of a *Bubonocele* are a round tumor in the groin, which preſſed, is eaſily forced in. The ſigns of an *Enterocele* are a hard tumor in the cod, which forced, returneth back and departeth with a certain murmur and pain; but the tumor proceeding of the kall, is lax and feels ſoft like wool, and which is more difficultly forced

in,

in,than that which proceeds from the guts, but yet without murmuring and pain: for the ſubſtance of the guts,ſeeing it is one, and continued to it ſelf,they doe not only mutually ſucceed each other,but by a certain conſequence doe,as in a dance draw each other, ſo to avoid diſtention,which in their membranous body cannot be without pain, by reaſon of their change of place from that which is naturall, into that againſt nature : none of all which can befall the kall,ſeeing it is a ſtupid body,and almoſt without ſenſe, heavy, dull, and immoveable.The ſigns that the *Peritonæum* is broken, are the ſudden increaſe of the tumor, and a ſharp and cutting pain ; for when the *Peritonæum* is only relaxed, the tumor groweth by little and little,and ſo conſequently with ſmall pain ; yet ſuch pain returns ſo often, as the tumor is renewed by the falling down of the gut, or kall, which happens not the *Peritonæum* being broken : for the way being once open,and paſſable to the falling body, the tumor it renewed without any diſtention, and ſo without any pain to ſpeak of. The reſt of the ſigns ſhall be handled in their places. Sometimes it happens that the guts, and kall,do firmly adhere to the proceſſe of the *Peritonæum*,that they cannot be driven back into their proper ſeat. This ſtubborn adheſion happens by the intervention of the viſcid matter, or by means of ſome excoriation cauſed by the rude hand of a Chirurgeon,in too violently forcing of the gut, or kall,into their place. But alſo by too long ſtay of the gut in the cod,and the neglect of wearing a Truſſe, may give occaſion to ſuch adheſion.A perfect and inveterate rupture by the breaking of the proceſs of the *Peritonæum* in men of full growth,never, or very ſeldome admits of cure. But you muſt note, that by great ruptures of the *Peritonæum*, the guts may fall into the cod,to the bigneſs of a mans head, without much pain and danger of life,becauſe the excrements,as they may eaſily enter,by reaſon of the largneſs of the place and rupture,ſo alſo they may eaſily return.

What rupture is uncurable.

CHAP. XV.

Of the cure of Ruptures.

BEcauſe children are very ſubject to Ruptures,but thoſe truly not fleſhy or varicous,but watry, windy, and eſpecially of the guts, by reaſon of continuall and painfull crying and coughing : Therefore in the firſt place we will treat of their cure. Wherefore the Chirurgeon,called to reſtore the gut which is faln down,ſhall place the child,either on a table, or in a bed,ſo that his head ſhall be low, but his buttocks and thighes higher;then ſhall he force with his hands by little and little, and gently,the gut into his proper place;and ſhall foment the groin with the aſtringent fomentation,deſcribed in the falling down of the womb. Then let him apply this remedy. ℞ *Præſcript. decoctionis quantum ſufficit, farinæ horſlei & faborum,an.* ℥j.*pulver. Aloes, Maſtiches, Myrtill. & Sarcoco. an.* ℥ß, *Boli Armeni* ℥ij. Let them be incorporated and made a cataplaſme according to Art. For the ſame purpoſe he may apply *Emplaſtrum contra Ruptu-ram*:but the chief of the cure conſiſts in folded clothes,and truſſes,and ligatures artificially made,that the reſtored gut may be contained in its place,for which purpoſe he ſhall keep the child ſeated in his cradle for 30 or 40 dayes, as we mentioned before; and keep him from crying,ſhouting,and coughing. *Actius* bids ſteep paper 3 dayes in water, and apply it made into a ball to the groin,the gut being firſt put up;for that remedy by 3 days adheſion will keep it from falling down. But it will be, as I ſuppoſe,more effectuall,if the paper be ſteeped not in common, but in the aſtringent water, deſcribed in the falling down of the womb. Truly I have healed many by the help of ſuch remedies, and have delivered them from the hands of Gelders, which are greedy of childrens teſticles,by reaſon of the great gain they receive from thence. They by a crafty cozenage, perſwade the Parents, that the falling down of the gut into the cod, is uncurable : which thing notwithſtanding experience convinceth to be falſe, if ſo be the cure be performed according to the forementioned manner, when the *Peritonæum* is only relaxed, and not broken : for the proceſs thereof by which the gut doth fall as in a ſteep way, in progreſs of time and age is ſtraitned and knit together,whilſt alſo in the mean time the guts grow thicker.

To what ruptures children are ſubject.

An aſtringent cataplaſme.

Ser. 1.*cap.*24.

The craft and covetouſneſs of Gelders.

A certain Chirurgeon who deſerveth credit,hath told me that he hath cured many children as thus:*He* beats a loadſtone into fine powder,and gives it in pap,and then he anoints with hony the groin,by which the gut came out,and then ſtrewed it over with fine filings of iron. He adminiſtred this kind of remedy for ten or twelve dayes : The part, for other things being bound up with a ligature and truſſe as was fitting.The efficacy of this remedy ſeemeth to conſiſt in this;that the loadſtone by a natural deſire of drawing the iron which is ſtrewed upon the groin, joins to it the fleſhy and fatty particles interpoſed between them, by a certain violent impetuoſity,which on every ſide preſſing and bending the looſneſs of the *Peritonæum*, yea verily adjoining themſelves to it, in proceſs of time by a firm adheſion intercept the paſſage and falling down of the gut or kall ; which may ſeem no more abhorring from reaſon, than that we behold the loadſtone it ſelf through the thickneſs of a table,to draw iron after it any way. The ſame Chirurgeon affirmed, that he frequently and happily uſed the following medicine.He burnt into aſhes in an oven red ſnails, ſhut up in an earthen pot, and gave the powder of them to little children in pap, but to thoſe which were bigger,in broth.

Another way to cure ruptures.

The reaſon of this cure.

Another medicine.

But

A notable History.

But we muſt deſpair of nothing in this diſeaſe, for the cure may happily proceed in men of full growth, as of fortie year old, who have filled the three dimenſions of the body, as this following relation teſtifies.

There was a certain Prieſt in the Pariſh of *St. Andrews*, called *John Moret*, whoſe office it was to ſing an Epiſtle with a loud voice as often as the ſolemnity of the day, and the thing required. Wherefore ſeeing he was troubled with the *Enterocele*, he came to me, requiring help, ſaying, he was troubled with a grievous pain, eſpecially then, when he ſtretched his voice in the Epiſtle.

When I had ſeen the bigneſs of the *Enterocele*, I perſwaded him to get another to ſerve in his place; ſo having gotten leave of M. *Curio* Clerk, and Deacon of Divinity, he committed himſelf unto me: I handled him according unto Art, and commanded him he ſhould never go without a Truſſe; and he followed my directions. When I met him ſome five or ſix years after, I asked him how he did, he anſwered very wel, for he was wholly freed from the diſeas with which he was formerly troubled; which I could not perſwade my ſelf of, before that I had found that he had told me the truth, by the diligent obſervation of his genitals. But ſome ſix moneths after, he dying of a Pleuriſie. I came to *Curio's* houſe where he died, and deſired leave to open his body, that I might obſerve whether nature had done any thing at all in the paſſage through which the gut fell down: I call God to witneſs, that I found a certain fatty ſubſtance about the proceſſe of the *Peritonæum* about the bigneſs of a little egg, and it did ſtick ſo hard to that place, that I could ſcarce pull it away without the rending of the neighbouring parts. And this was the ſpeedy cauſe of his cure. But it is moſt worthy of obſervation, and admiration, that Nature but a little helped by Art, healeth diſeaſes which are thought incurable. The chief of the cure conſiſts in this, that wee firmly ſtay the gut in its place, after the ſame manner as theſe two figures ſhew.

We muſt never deſpair in diſeaſes if ſo be nature be aſſociated by art.

The figure of a man broken on one ſide, wearing a Truſſe, whoſe bolſter muſt have three Tuberoſities, two on the upper, and one on the lower part; and there muſt be a hollowneſs betweeh them in the midſt, that they may not too ſtraitly preſs the ſhare-bone, and ſo cauſe pain. The manner of ſuch a Truſſe, I found out not long agoe, and it ſeemed better and ſafer than the reſt for to hinder the falling down of the gut and kall.

A. *Shews the ſhoulderband which is tied before and behind to the girdle of the Truſſe.*
B. *The Truſſe.*
C. *The Cavity left in the midſt of the Tuberoſities.*

In the mean time we muſt not omit diet. We muſt forbid the uſe of all things, which may either relax, dilate, or break the proceſs of the *Peritonæum*, of which I have already treated ſufficiently. Sometimes, but eſpecially in old men, the guts cannot be reſtored into their place, by reaſon of the quantity of the excrements hardned in them: In this caſe they muſt not be too violently forced, but the patient muſt be kept in his bed, and lying with this head low, and his knees higher up; let the following Cataplaſmes be applied.

Another

Another Figure of a man having a Rupture on both sides, shewing by what means, what kind of Trusse, and what shoulder-band he must be bound on each groin.

A. *Sheweth the shoulder-band divided in the midst for the putting through of the head.*

B. *The Truss, with two bolsters, between which is a hole for putting through the yard. The form of both bolsters ought to be the same with the former.*

℞ *rad. alth. & lil. ana* ℥ij. *seminis lini & fænugr. an.* ℥ß, *fol. malvæ, viol. & pariet. an.* m. ß. Let them be boiled in fair water, afterwards beaten, and drawn through a searse, adding thereto of new butter without salt, and oil of Lillies, as much as shall suffice. Make a cataplasme in the form of a liquid pultis. Let it be applied hot to the cod, and bottome of the belly; by the help of this remedy when it had been applied all night, the guts have not seldome been seen of themselves, without the hand of a Chirurgeon, to have returned into their proper place. The windines being resolved, which hindered the going back of the excrements into another gut, whereby they might be evacuated and expelled. But if the excrements will not goe back thus, the flatulencies, yet resisting and undiscussed, an emollient and carminative clyster is to be admitted, with a little Chymicall oyl of Turpentine, Dill, Juniper or Fennill. Clysters of Muscadine, oyl of Wallnuts, and *Aqua vitæ*, and a small quantity of any the aforesaid oyls, are good for the same purpose.

A Cataplasme to soften the excrements.

Chymicall oyl.

It often happens that the guts cannot yet be restored, because the process of the *Peritonæum* is not wide enough. For when the excrements are fallen down with the gut into the cod; they grow hard by little and little, and encrease by the access of flatulencies caused by resolution, which cause such a tumor as cannot be put up through that hole, by which a little before it fell down: whereby it happens that by putrefaction of the matter there contained, come inflammations, and a new access of pain; and lastly, a vomiting and evacuation of the excrements by the mouth being hindered from the other passage of the fundament. They vulgarly call this affect *Miserere mei*. That you may help this symptome, you must rather assay extreme remedies, than suffer the patient to die by so filthy and loathsome a death. And we must cure it by Chirurgery after this manner following. We will bind the patient lying on his back, upon a table or bench; then presently make an incision in the upper part of the cod, not touching the substance of the guts; then we must have a silver Cane or Pipe, of the thickness of a Goose quill, round, and gibbous in one part thereof, but somewhat hollowed in the other, as is shewed by this following Figure.

The Figure of the Pipe or Cane.

We must put it into the place of the incision, and put it under the production of the *Peritonæum* being cut together with the cod, all the length of the prodnction, that so with a sharp knife we may divide the process of the *Peritonæum*, according to that cavity separated from the guts there contained, by the benefit of the Cane in a right line not hurting the guts. When you have made an indifferent incision, the guts must gently be put up into the belly with your fingers, and then so much of the cut *Peritonæum* must be sowed up, as shall seem sufficient, that by that passage made more strait, nothing may fall into the cod after it is cicatrized.

But if there be such abundance of excrements hardned, either by the stay or heat of inflammation, that that incision is not sufficient to force the excrements into their place, the incision must be made longer, your Cane being thrust up towards the belly: so that it may be sufficient for the free regress of the guts into the belly. Then sow it up as is fit, and the way will be shut up against the falling down of the gut or kall; the process of the *Peritonæum* being made more strait, by reason of the suture; for the rest, the wound shall be cured according to Art. But before you undertake this work, consider diligently whether the strength of the Patient be sufficient, neither attempt any thing before you have foretold, and declared the danger to the Patients friends.

CHAP. XVI.

Of the golden Ligature, or the Punctus Aureus, *as they call it.*

The Chirurgicall cure by the golden Tie.

IF the Rupture will not be cured by all these means, by reason of the great solution of the continuity of the relax'd or broken *Peritonæum*, and the patient by the consent of his friends there present, is ready to undergoe the danger in hope of recovery; the cure shall be attempted by that which they call the *Punctus Aureus*, or Golden tie.

For which purpose a Chirurgeon which hath a skilful and sure hand, is to be imployed. He shall make an incision about the share bone, into which he shall thrust a Probe like to the Cane, a little before described; and thrust it long wayes under the process of the *Peritonæum*, and by lifting it up, separate it from the adjoining fibrous, and nervous bodies, to which it adheres; then presently draw aside the spermatick vessels, with the *Cremaster*, or hanging muscle of the testicle; which being done, he shall draw aside the processe it self, alone by it self: And he shall take as much thereof, as is too lax, with small and gentle mullets, perforated in the midst, and shal with a needle, having five or six threds, thrust it through as neer as he can to the spermatick vessels, and Cremaster muscles. But the needle also must bee drawn again in to the midst of the remnant of the process, taking up with it the lips of the wound; then the thred must be tied on a strait knot, and so much thereof must be left after the section, as may be sufficient to hang out of the wound. This thred will of it self be dissolved by little aud little by putrefaction: neither must it be drawn out before that nature shall regenerate and restore flesh into the place of the ligature, otherwise all our labour shall be spent in vain.

And lastly, let the wound be clensed, filled with flesh, and cicatrized, whose callous hardness may withstand the falling of the gut or kall.

Another manner thereof.

There are some Chirurgeons who would perform this golden ligature after another manner. They cut the skin above the share bone where the falling down commonly is, even to the process of the *Peritonæum*, and they wrap once or twice about it, being uncovered, a small golden wire, and only straiten the passage as much as may suffice to amend the looseness of this process, leaving the spermatick vessels at liberty; then they twist the ends of the wire twice or thrice with small mullets, and cut off the remnant thereof; that which remains after the cutting, they turn in, lest with the sharpness it should prick the flesh growing upon it. Then leaving the golden wire there, they cure the wound like to other simple wounds, and they keep the patient some fifteen or twenty daies in his bed, with his knees something higher, and his head something lower.

Many are healed by this means; others have fallen again into the disease by reason of the ill twisting of the wire.

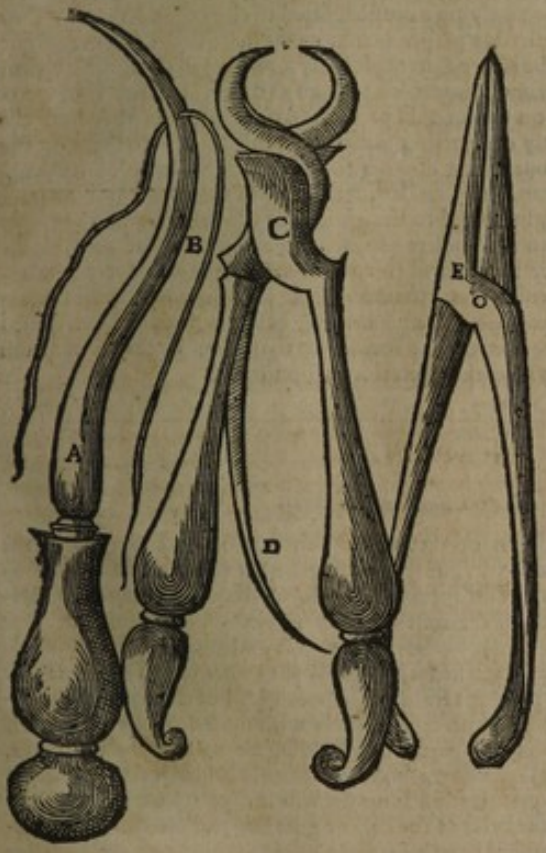
There

There is also another manner of this golden tie, which I judg more quick and safe, even for that there is no externall body left in that part after the cure. Wherefore they wrap a leaden wire in stead of the golden, which comes but once about the process of the *Peritonæum*; then they twine it as much as need requires; that is, not too loosly, lest it should leave way for the falling down of the body, neither too straitly, lest a Gangrene should come by hindring the passage of the spirits and nourishment. The ends thereof are suffered to hang out; when in process of time, this contraction of the *Peritonæum* seems callous, then the wire is untwisted and gently drawn out. And the rest of the cure performed according to Art. But let not the Chirurgeon thrust himself upon his work rashly, without the advice of the Physitian, for it diverse times comes to pass, that the testicles are not as yet fallen down into the cod by the too great sluggishness of nature, in some of a pretty growth, but remains long in the groins, causing a tumor with pain, which thing may make a good Chirurgeon beleeve that it is an *Enterocele*. Therefore whilst he labors by repelling medicines and trusses to force back this tumor, he encreaseth the pain, and hinders the falling down of the testicles into the cod. I observed this not long agoe in a Boy, which an unskilful Chirurgeon had long, and grievously troubled, as if he had had a rupture: for when I had observed that there was but one stone in the cod, and knew the boy was never gelt, I bid them cast away the plaisters and trusses, and wisht his parents that they should suffer him to run and leap, that so the idling stone might be drawn into the cod, which thing by little and little, and without pain, had the event, as I foretold.

The third manner thereof.

A thing to be noted.

A History.



A. *Shewes a crooked needle, having an eye not far from the point, through which you may put the golden wire.*

B. B. *The golden wire put through the eye of the needle.*

C. *The mullets or Pincers, to cut away the waist or superfluous ends of the wire.*

D. *The spring of the mullets.*

E. *The mullets to twist the ends of the wire together.*

That the reason of this affect may be understood, we must know a man differs from a woman, only in efficacy of heat; but it is the nature of strong heat to drive forth, as of cold to keep in. Hence it is that the stones in men hang forth in the cod, but in women they lie hid in the lower belly. Therefore it happens that in some males more cold by nature, the testicles are shut up some certain time, untill at length they are forc't down into the cod by youthfull heat. But that we may return to our former treatise of the cod, although that way of curing ruptures wants not pain and danger, yet it is safer than that which is performed by gelding, which by the cruelty thereof expose the patient to manifest danger of death. For the gelders whilst they fear lest when the cure is finished, the relaxation may remain, pull with violence the process of the *Peritonæum* from the parts to which it

adheres, and together with it a nerve of the ſixth conjugation which runs to the ſtones; they offer the ſame violence to the ſpermatick veſſels; by which things enſue great pain, convulſion, efflux of blood, inflammation, putrefaction, and laſtly, death, as I have obſerved in many whom I have diſſected, having died a few daies after their gelding. Although ſome eſcape theſe dangers, yet they are deprived of the faculty of generation for all their life after, for performance whereof, nature hath beſtowed the teſticles, as parts principally neceſſary for the conſervation of mankind. Through which occaſion *Galen* hath not feared to prefer them before the heart; becauſe the heart is the beginning of life, but the teſticles of a better life; for it is far more noble to live well, than ſimply and abſolutely to live; therefore Eunuches degenerate into a womaniſh nature, for they remain without beards, their voice is weak, their courage fails them, and they turn cowards; and ſeeing they are unfit for all humane actions, their life cannot but be miſerable. Wherefore I wil never ſubſcribe to the cutting out of the ſtones, unleſs a *Sarcocele* or Gangrene invade them. But that the way of performing the *Punctus aureus* may be better known, I have thought good here to ſet the inſtruments, by which this operation is performed, before your view.

Lib. de arte medica.

Lib. de ſem.

Another more eaſie and ſafe way to reſtore the gut and kall.

Lib. 3. cap. 33. *Theodorick* and *Guido* have invented another way of performing this operation. They put back into their places the gut and kall being fallen down, the patient being ſo placed, that his thighs are high and his head is ſomewhat low; then they draw aſide the lower portion of the production of the *Peritonæum*, and alſo the ſpermatick veſſels, and cremaſter muſcle to the *Iſchium*; then by applying a cauſtick fitted to the age and diſeaſe, they burn the other part of the proceſs, directly perpendicular to the ſhare bone, where the gut did fall down. Then they pull off the eſchar thus made with a knife even to the quick, then they apply another cauſtick in the ſame place, which may go even to the bone, then procure the falling of this eſchar made on the foreſaid proceſs. And afterwards they heal the ulcer which remains, which preſently contracting ſomewhat a thick *Callus*, ſo keeps up the guts and kall, that it binds them from falling down into the cod. This way of reſtoring the gut and kall, though it be ſafer and more facile; yet the Chirurgeon muſt not attempt it, if the guts or kall ſtick ſo faſt, agglutinated to the proceſs of the *Peritonæum*, that they cannot be ſevered, nor put back into their places (for from the guts ſo burnt and violated, greater miſchief would enſue) if by the broken and too much dilated proceſs, the bodies thereby reſtrained, make an exceeding great tumor by their falling down; if the teſticle yet lying in the groin as in a *Bubonocele*, a kind of *Enterocele*, being not yet deſcended into the *Scrotum* or cod; if the patients be not come to ſuch age as they can keep themſelves from ſtirring, or hold their excrements whiles the operation is performed.

CHAP. XVIII.

Of the cure of other kinds of Ruptures.

Epiplocele is the falling down of the kall into the groin, or cod, it hath the ſame cauſes as an *Enterocele*. The ſigns have been explained. It is not ſo dangerous, nor infers a conſequence of ſo many evill ſymptomes, as the *Enterocele* doth, yet the cure is the ſame with the other.

What a *Hydrocele* is.

Hydrocele is a wateriſh tumor in the cod, which is gathered by little and little between the membranes encompaſſing the teſticles, eſpecially the *Dartes* & *Erythroides*; it may be called a particular dropſie, for it proceeds from the ſame cauſes, but chiefly from the defect of native heat. The ſigns are a tumor encreaſing ſlowly without much pain, heavy, and almoſt of a glaſſie clearneſs, which you may perceive by holding a candle on the other ſide, by preſſing the cod above, the water flows down, and by preſſing it below, it riſes upwards, unleſs peradventure in too great a quantity it fills up the whole capacity of the cod, yet it can never be forced or put up into the belly as the kall or guts may, for oft-times it is contained in a ciſt or bag; it is diſtinguiſhed from a *Sarcocele*, by the ſmoothneſs and equality thereof. The cure muſt firſt be tried with reſolving, drying and diſcuſſing medicines, repeated often before, and in the Chapter of the dropſie; this which follows I have often tried and with good ſucceſs.

The ſigns.

The Cure.

A medicine to draw forth the contained matter.

℞ *Vng. comitiſſæ, & deſiccat. rub. an.* ℥ij. *malaxentur ſimul*, and make a medicine for your eaſe. The water by this kind of remedy is digeſted and reſolved, or rather dried up, eſpecially if it be not in too great quantity. But if the ſwelling, by reaſon of the great quantity of water, will not yeeld to thoſe remedies, there is need of Chirurgery; the cod and membranes wherein the water is contained, muſt be thruſt through with a Seton, that is, with a large three-ſquare pointed needle, thred with a ſkean of ſilk; you muſt thruſt your needle preſently through the holes of the mullets made for that purpoſe, not touching the ſubſtance of the Teſticles. The ſkean of thred muſt be left there, or removed twice

or

or thrice a day,that the humor may drop down,and be evacuated by little and little. But if the pain be more vehement by reaſon of the Seton, and inflammation come upon it,it muſt be taken away, and neglecting the proper cure of the diſeaſe, we muſt reſiſt the ſymptoms.

Some Practitioners uſe not a Seton,but with a Razor, or inciſion knife, they open the lower part of the cod,making an inciſion ſome half fingers bredth long,penetrating even to the contained water;alwaies leaving untouched the ſubſtance of the teſticles and veſſels, and they keep the wound open, untill all the water ſeems evacuated; truly by this only way the cure of a watery rupture whoſe matter is contained in a ciſt, is ſafe, and to be expected;as we have ſaid in our Treatiſe of Tumors in generall.

What a *Pneumatocele* is.

The *Pneumatocele*,is a flatulent tumor in the cod,generated by the imbecillity of heat reſiding in the part.

The Cure.

It is known by the roundneſs,lenity, renitency and ſhining. It is cured by preſcribing a convenient diet,by the application of medicines which reſolve and diſcuſſe flatulencies, as the ſeeds of Annis, Fennell, Fænugreek, *Agnus Caſtus*,Rue, *Origanum*,other things ſet down by *Avicen* in his Treatiſe of Ruptures.I have often uſed with good ſucceſs for this purpoſe, *Emplaſtrum Vigonis cum Mercurio*; and *Emplaſtrum Diacalcitheos*,diſſolved in ſome good wine,as Muſcadine,with oyl of Bayes.

What a *Sarcocele* is.

A *Sarcocele* is a tumor againſt nature, which is generated about the ſtones by a ſcirrhous fleſh. Groſſe and viſcid humors breed ſuch kind of fleſh,which the part could not overcome and aſſimilate to it ſelf; whence this over-abundance of fleſh proceeds like as Warts do. *Varices*, or ſwoln veins often aſſociate this tumor;and it increaſes with pain.It

The Signs. Prognoſticks.

is known by the hardneſs,aſperity, inequality, and roughneſs. It cannot be cured but by amputation or cutting it away;but you muſt diligently obſerve,that the fleſh be not grown too high,and have already ſeized upon the groin,for ſo nothing can be attempted without the danger of life.

The Cure.

But if any may think, that he in ſuch a caſe may ſomewhat eaſe the patient by the cutting away of ſome portion of this ſame ſoft fleſh,he is deceived. For a *Fungus* will grow,if the leaſt portion thereof be but left,being an evill ſure worſe than the former; but if the tumor be either ſmall or indifferent, the Chirurgeon taking the whole tumor,that is, the teſticle tumified through the whole ſubſtance,with the proceſs incompaſſing it, and adhering thereto on every ſide,and make an inciſion in the cod, even to the tumor;then ſeparate all the tumid body, that is, the teſticle from the cod; then let him thruſt a needle with a ſtrong thred in it, through the midſt of the proceſs,above the region of the ſwoln teſticle; and then preſently let him thruſt it the ſecond time through the ſame part of the proceſs; then ſhall both the ends of the thred be tied on a knot,the other middle portion of the *Peritonæum* being comprehended in the ſame knot. This being done, he muſt cut away the whole proceſs with the teſticle comprehended therein.But the ends of the thred, with which the upper part of the proceſs was bound, muſt be ſuffered to hang ſome length out of the wound,or inciſion of the cod. Then a repercuſſive medicine ſhall be applied to the wound,and the neighbouring parts with a convenient ligature. And the cure muſt be performed as we have formerly mentioned.

What a *Cirſocele* is.

The *Cirſocele* is a tumor of veins dilated, and woven with a various and mutuall implication about the teſticle and cod,and ſwelling with a groſſe and melancholy bloud. The cauſes are the ſame as thoſe of the *Varices*.But the ſigns are manifeſt.

The Cure.

To heal this tumor, you muſt make an inciſion in the cod,the bredth of two fingers to the *Varix*.Then you muſt put under the varicous vein, a needle having a double thred in it, as high as you can,that you may bind the roots thereof: then let the needle be again put after the ſame manner about the lower part of the ſame vein, leaving the ſpace of two fingers between the ligatures.But before you bind the thred of this loweſt ligature,the *Varix* muſt be opened in the midſt,almoſt after the ſame manner as you open a vein in the arm to let bloud: That ſo this groſſe blood cauſing a tumor in the cod,may be evacuated as is uſually done in the cure of the *varices*.The wound that remains ſhall be cured by the rules of Art after the manner of other wounds: Leaving the threds in it, which preſently fall away of themſelves. To conclude then,it being grown callous, eſpecially in the upper part thereof, where the vein was bound,it muſt be cicatrized,for ſo afterwards the bloud cannot be ſtrained or run that way.

Hernia Humoralis

Hernia Humoralis is a tumor generated by the confuſed mixture of many humors in the cod, or between the tunicles which involve the teſticles, often alſo in the proper ſubſtance of the teſticles. It hath like cauſes, ſigns and cure as other tumors.While the cure is in hand,reſt, truſſes, and fit rowlers to ſuſtain and bear up the teſticles, are to be uſed.

CHAP. XVIII.

Of the falling down of the Fundament.

The cauſes.

WHen the muſcle called the *Sphincter* which ingirts the Fundament is relaxed, then it comes to paſſe that it cannot ſuſtain the right gut. This diſeaſe is very frequent to Children by reaſon of the too much humidity of the belly; which falling down upon that muſcle mollifieth and relaxeth it or preſſeth it down by an unaccuſtomed weight, ſo that the muſcles called *Levatores Ani*, or the lifters up of the Fundament, are not ſufficient to bear up any longer. A great bloudy flux gives occaſion to this effect. A ſtrong endevour to expell hard excrements, the *Hæmorrhoids*, which ſuppreſſed do over-load the right gut, but flowing relax it: Cold, as in thoſe which go without breeches in winter, or ſit a long time upon a cold ſtone, a ſtroak or fal upon the holy-bone, a palſie of nerves which go from the Holy-bone to the muſcles the lifters up of the fundament: the weight of the ſtone being in the bladder.

The cure.

That this diſeaſe may be healed, we muſt forbid the Patient too much drinking, too often eating of broth, and from feeding on cold fruits. For locall medicines the part muſt be fomented with an aſtringent decoction made of the rinds of Pomegranats, galls, myrtles, knotgraſſe, ſhepherds purſe, cypreſs nuts, alum, and common ſalt boiled in ſmiths water or red wine. After the fomentation, let the gut be anointed with oyl of Roſes or myrtles, and then let it be gently put by little and little into its place, charging the child if he can underſtand your meaning, to hold his breath. When the gut ſhall be reſtored, the part muſt be diligently wiped leſt the gut fall down again by reaſon of the ſlipperineſs of the unction. Then let the powder preſcribed for the falling down of the womb be put into the fundament as far as you can: Then you muſt ſtraitly bind the loins with a ſwath, to the midſt whereof behind let another be faſtned which may be tied at the *Pubes* coming along the *Perinæum*, ſo to hold up the fundament; the better to contain it in its place, a ſponge dipt in the aſtringent decoction. The patient if he be of ſufficient age to have care of himſelf, ſhall be wiſhed when he goes to ſtool that he ſit upon two pieces of wood being ſet ſome inch a ſunder, leſt by his ſtraining he thruſt forth the gut together with the excrement; but if he can do it ſtanding, he ſhall never by ſtrayning thruſt forth the gut.

Hippocrates his cure.

But if the gut cannot by the preſcribed means be reſtored to its place, *Hippocrates* bids that the Patient hanging by the heels be ſhaken, for ſo the gut by that ſhaking will return to his place: but the ſame *Hippocrates* wiſheth to anoint the fundament, becauſe that remedy having a drying faculty, hath alſo power to reſolve the flatulent humors without any acrimony, by reaſon of which the gut was the leſs able to be contained in his place.

CHAP. XIX.

Of the Paronychia.

What the *Paronychia* is.

THe *Paronychia* or *Panaris* is a tumor in the ends of the fingers, with great inflammation, coming of a malign and venemous humor, which from the bones by the *Periosteum* is communicated to the tendons and nerves of that part which it affecteth, whereof cruell ſymptoms do follow, as pulſifique pain, a feaver, reſtleſneſs, ſo that the affected through impatiency of the pain are variouſly agitated like thoſe tormented with Carbuncles: for which cauſe *Guido* and *Johannes de Vigo* judge this diſeaſe to be mortall; wherefore you muſt provide a skilfull Phyſitian for the cure of this diſeaſe, which may appoint convenient diet, purging and blood-letting. In the mean time the Chirurgeon ſhal make way for the virulent and venenate matter, by making inciſion in the inner part of the finger, even to the bone alongſt the firſt joint thereof; for *Vigo* ſaith there is not a preſenter remedy, if ſo be that it be quickly done and before the maturation of the matter; for it vindicates the finger from the corruption of the bone and nerves, and aſſwages pain, which I have often and happily tried immediately at the beginning, before the perfect impreſſion of the virulencie.

Lib. cap. 4. tract.

But the wound being made you muſt ſuffer it to bleed well, then preſently let him dip his finger in ſtrong and warm vinegar, in which ſome treakle being diſſolved may draw forth the virulencie. But to appeaſe the pain, the ſame remedies muſt be applyed to the affected part as are uſed in Carbuncles, as the leaves of Sorrell, Henbane, Hemlock, Mandrake roaſted under the Embers and beaten in a Morter with new *Vnguentum Populeon*, or oyl of Roſes or new butter without ſalt: for ſuch like medicines alſo helpe forward ſuppuration: whilſt by their coldneſs, they repreſs the extraneous heart affecting the part; and ſo ſtrengthen the native heat being the author of ſuppuration: which reaſon moved the ancient Phyſitians to uſe ſuch medicines in a Carbuncle: but if by reaſon of the fearfulneſs of the patient, or unskilfulneſſe of the Chirurgeon,

no

no inciſion being made,a Gangren and Sphacel ſhall poſſeſs the part, it remains that you cut off with your cutting mullets as much of the part as ſhall be corrupt, and perform the reſt of the cure according to Art. Yet it doth not ſeldome happen that there may be no need to cut off ſuch a finger, becauſe it being corrupted together with the bone by little and little diſſolve into a purulent or rather ſanious or much ſtinking filth. But in this affect there is often cauſed an Eſchar by the aduſtion of putredinous heat, and ſuperfluous fleſh indued with moſt exquiſite ſenſe groweth underneath it,which muſt in like manner be cut off with the Mullets that the part may receive comfort,the pain being aſſwaged by the copious effuſion of blood.

CHAP. XX.

Of the ſwelling of the Knees.

Gal. com ad ſent. 1 ſer. 4. lib. 6. Epid. Gal. Com. ad ſent. 67 ſect. 2. prog.

AFter long and dangerous diſeaſes there oftentimes ariſe Tumors in the knees, and alſo in Plethorick bodies and ſuch as have evill juyce after labours and exerciſe. This kind of diſeaſe is frequent becauſe the humor eaſily falls into the part which hath been heated by labour. But if ſuch tumors follow long diſeaſes, they are dangerous and difficult to cure,and therefore not to be neglected,for bitter pain accompanieth them,becauſe the humor falling thither diſtends the Membranes,which being many involve the part; beſides that this humor participateth of a certain virulent aud maligu quality whether it be cold or hot,when it hath ſetled into thoſe parts,being ſuch as we find in the pains of the joynts,and in the bitings of venemous creatures.

The Cure.

For the cure if the tumor be cauſed by blood,let a ſlender and a refrigerating diet be appointed,and phlebotomy for the revulſion of the antecedent cauſe; divers locall medicines ſhall be uſed according to the variety of the four times.But for to aſſwage the pain, *Anodyne*, or mitigating medicines ſhall be appointed: of all which we have ſufficiently treated in the Chapter of the cure of a Phlegmon.

And becauſe theſe parts are of exact ſenſe,if there be neceſſity to open the tumor,yet muſt we not do it raſhly or unconſideratly,for fear of pain and evill accidents.

This kind of tumor is oft-times raiſed by wind contained there; in which caſe the Chirurgeon muſt be very provident, that he be not deceived with the ſhew of flowing of the humor, which he ſeems to perceive by the preſſure of his fingers, as if there were matter and humor contained therein,and ſo be brought to open the tumor. For the wind breaking forth in ſtead of the humor, cauſeth evill ſymptomes by reaſon of the ſection raſhly made in a part ſo ſenſible.

But if wateriſh humors ſhall tumefie the part,the body ſhall firſt be purged with medicines purging flegm: And then inciding, attenuating, rarifying, diſcuſſing and very drying locall medicines ſhall be uſed.

Of which we have abundantly ſpoken in the Chapter of the *Oedema*. Yet this humor divers times lyes deep between the whirl bone and the joint, which cauſeth it that it can be diſcuſſed and reſolved by reaſon of the weakneſs of the part and defect of heat, ſo that the adventitious humor often moves and excludes the bones from their ſeat. As I have obſerved it to have happened to many.

In which cauſe Irrigations of red wine falling ſomething high,whereby the force of the medicine may enter and more eaſily penetrate,are much commended.

CHAP. XXI.

Of the Dracunculus.

It is not as yet ſufficiently known what Dracunculi are.

I Cannot chuſe, but explain in this place thoſe things which may be ſpoken of that kind of tumor againſt nature, which by the ancients is called *Dracunculus*. The matter & reaſon of theſe hath been variouſly handled by divers Authors, ſo that hitherto we have nothing written of them to which we may by right and with good reaſon adhere as a firm foundation of their eſſence.

For firſt, for *Galens* opinion, *Lib. 6. de Loc. affect. cap. 3.* The generation,ſaith he, of thoſe haits which are evacuated by the urine is worthy no leſs admiration than the *Dracunculi*, which as they ſay,in a certain place of *Arabia* breed in the legs of men being of a nervous nature and like worms in colour and thickneſs.

Therefore ſeeing I have heard many who have ſaid they have ſeen them, but I my ſelf never ſaw them, I cannot conjecture any thing exactly neither of their originall nor eſſence.

Paulus Ægineta writes that the *Dracunculi* are bred in *India*, and the higher parts of *Ægypt*, like worms in the muſculous parts of mans body,that is,the arms, thighs,and legs, and alſo creep by the intercoſtall muſcles in children with a manifeſt motion. *Lib 4. cap. 41.*

The cure out of *Ægineta*.

But whether they be creatures indeed,or only have the ſhape of creatures, they muſt be cured with a hot fomentation, by which the *Dracunculus* raiſed to a juſt tumor, may put forth it ſelf,and be pluckt away peece-meal with the fingers: alſo ſuppurating Cataplaſms

may

may be applyed, compoſed of water, hony, wheat and barly meal.

Cap. 21. lib. 4. ſent. 3. tract. 3. *Avicen* being various, having no certainty whereon to reſt, inclineth one while to this, and another while to that opinion: for now he ſpeaketh of the *Dracunculi* as of creatures, then preſently of a matter and humor ſhut up in a certain place; for the reſt he rightly delivers the cure and eſſence of this diſeaſe, as we ſhall afterwards ſhew.

Lib. 14. cap. ult. *Actius* ſaith, the *Dracunculi* are like worms, and that they are found ſometimes great, ſometimes ſmall, and that their generation is not unlike to that of flat worms, which are bred in the guts, for they move under the skin, without any trouble, but in proceſs of time, the place becomes ſuppurate about the end of the *Dracunculus*. The skin openeth, and the head thereof is thruſt forth.

But if the *Dracunculus* be pulled it cauſeth great grief; eſpecially if it be broken by too violent pulling. For that which is left cauſeth moſt vehement pain. Wherefore that the creature may not run back, the arm muſt be bound with a ſtrong thred, and this muſt be done every day, that the *Dracunculus* going forward by little and little, may be intercepted by this binding, but not broken off.

The Cure out of *Actius*.

The place muſt be bathed with *Aqua Mulſa* and oyl in which wormwood or ſouthernwood hath been boyled, or ſome other of thoſe medicines which are preſcribed for the worms of the belly.

But if the *Dracunculus* going forward of its one accord, may be eaſily drawn forth, we muſt do nothing elſe: but if it be turned to ſuppuration we muſt not leave off the Cataplaſms, the *Aqua Mulſa* and anointing with oyl: It was uſuall with him after the taking away of the Cataplaſms, to apply *Emplaſtrum e Baccis Lauri*: but when it is come to ſuppuration the skin muſt be opened long wayes, and the *Dracunculus* ſo laid open muſt be taken away, but the skin muſt be filled with lint, and the reſt of the ſuppurative cure uſed, ſo that the creature being ſuppurated and drawn forth, the wound may be incarnated and cicatrized.

Tract. 7. cap. 34. *Rhaſis* writeth, that when the part is lifted up into a bliſter, and the vein haſtneth its egreſs, it is good for the Patient to drink the firſt day half a dram of *Aloes*, the next day a whole dram, the third day two drams; and in like manner the place affected muſt be fomented with *Aloes*, for ſo that which lies hid will break forth: that which ſhall come forth muſt be rolled in a pipe of lead, which may equal the weight of a dram ſo that it may hang down, for the vein drawn by the weight will come more forth; and when that which ſhall come forth is grown much and long, it muſt be cut off, but not by the root, but ſo that a portion thereof may remain and hang forth, to which the leaden pipe may be faſtened, for otherwiſe it would withdraw it ſelf into it skin and its lurking hole, and ſo cauſe a putrid and malign ulcer.

The cure out of *Rhaſis*.

Therefore we muſt gently meet with this diſeaſe, and the vein muſt be drawn by little and little out of the body untill it be all come forth that no worſe thing happen: but if by chance it ſhall happen that as much of the vein as ſhall be come forth ſhall be cut off by the roots, then the Ulcer muſt be opened long wayes with an inciſion knife, and that ſo that whatſoever remains thereof may be wholly taken away. Then for ſome dayes the part muſt be anointed with butter untill whatſoever of ſuch a ſubſtance adheres, being conſumed with putrefaction ſhall flow away. Then the Ulcer muſt be cured with ſarcotick things.

His opinion of them.

Therefore *Rhaſis* thus in the ſame text expreſſeth the ſame thing by divers names, and armed with Iron and Lead, he comes to the cure thereof, as if he meant to encounter with ſome fierce beaſt.

Soranus his opinion.

Soranus the Phyſitian, who lived in the times of *Galen*, was of a quite contrary opinion, as *Paulus Æginet a* in the place being before cited, relates of him; as who denies the *Dracunculus* to be a living creature, but only a condenſation of a certain ſmall nerve, which ſeems both to the Phyſitians and Patients to have ſome motion under the skin.

Wherefore *Soranus* ſeems to have come neerer the truth than the reſt, but yet not ſo, as throughly to underſtand, and know the eſſence of this diſeaſe, as we ſhall demonſtrate hereafter.

Epiſt. 2. lib. 7. *Manardus* writes, that the *Dracunculi* are generated of evill and unlaudable blood, groſs, hot, and melancholick, or of aduſt phlegm very much dryed.

Gorræus a moſt learned Phyſitian of our time, *Lib. de Definitionib. medic.* denyes any of our Phyſitians to be able to ſay any thing of the *Dracunculi*, becauſe it is a diſeaſe ſo untrequent in theſe our regions, that it is ſcarſe ever met withall in practice.

The Author of the Introduction, and Medicinall definitions, defines the *Dracunculus* to be a diſeaſe very like the *Varices*; then cauſing great pain, when increaſing by little, and little, it begins to be moved: Therefore to be cured after the ſame manner, and by the ſame method of Section and inciſion, as the *Varices* are. Which thing chiefly ſeems to have moved *Guido* to refer this kind of diſeaſe to the *Varices* in his Tractate of Impoſtumes, becauſe it hath the ſame cauſe, and is healed with the ſame remedy as the *Varices*.

But ſeeing that divers names have been impoſed upon this diſeaſe by ſeverall writers, yet they have all expreſſed it by the name of a vein, for it is called by *Avicen* and *Guido*, *Vena Medeni*, becauſe it is a diſeaſe frequent in the City *Medina*: by *Albucraſis*, *vena civilis*. *Haliabas* hath

hath called it *vena famoſa*; others have called it *Vena Cruris* or the leg vein. Truly the contrariety of ſo many opinions repugnant not only amongſt themſelves, but alſo with themſelves, eaſily argueth how little certainty they had of the eſſence of this diſeaſe, who have written of it unto us: To which alſo this may be added, that none of the latter Phyſitians have written any things thereof. For although *Jacobus Dalechampius* a man moſt converſant in every part of Phyſick, hath written much of this matter in his book of the French Surgery which he ſet forth ſome years ago: Yet he hath left us no amplier teſtimony of his induſtry, than that he was very diligent in collecting the writings of the Ancients concerning this thing, interpoſing no judgment of his own, the better to aſſure us of a thing ſo controverted.

But my modeſty cannot ſo contain me, but that I ſhall chuſe rather to undergoe the cenſure of being thought too daring, than (as much as in me lyeth) to ſuffer this queſtion of the *Dracunculi* to remain longer ambiguous and undecided. Therefore for the preſent, I will thus order it, that refuting the opinions of the Ancients I may ſtrengthen by certain reaſons, my opinion of the eſſence and cure of this diſeaſe.

For firſt, that *Dracunculi* are no living things, nor like unto worms, nor of like generation as the flat worms of the belly, which was the opinion of *Actius*, is eaſie to diſprove both by his writings, as alſo by reaſon it ſelf. For he writes that the broad worm which he cals *Tenia*, is as it were a certain *Metamorphoſis* or tranſmutation of the inner tunicle of the ſmal guts into a quick living and movable body. *Actius* opinion confuted. *Tract. 3. ſerm. 1 cap. 40.*

But no man ever ſaid, neither will he confeſs that the *Dracunculi* hath the material cauſes of their beginning from the Tunicle of the vein, in which they are cloſed, or from the fibers of a nervous body, to which often they are adjoined; but much leſs from the skin under which they lye, may they draw their materiall cauſes of their originall.

Moreover, neither can there be any generation of worms, nor of any other living creatures whatſoever, who have their originall from putrefaction, unleſs by the Corruption of ſome matter, of whoſe better and more benign part, nature by the force of the vitall heat, produceth ſome animate body, as *Ariſtotle* teacheth. Wherefore to produce this effect, it is fit the matter ſhould have ſuch a diſpoſition to putrefaction as is required for the generation of ſuch a creature as they would make the *Dracunculus* to be: It is fit the helping cauſes ſhould coucur as aſſiſtants to the principals in the action. And it is meet the place ſhould be opportune or fit. *4. Meteorolog.*

But there may be many cauſes found which may give life to the *Dracunculi*, for by the common conſent of all thoſe who have written of them, their generation proceeds from an humor melancholick, terreſtriall and groſs, which by its qualities both by the firſt coldneſs and dryneſs, as alſo by the ſecond, that is Acidity, is not only thought moſt unfit of all others for putrefaction, but alſo is judged to reſiſt putrefaction, as that which is cauſed by heat and ſuperfluous heat humidity. Beſides if the materiall cauſe of this diſeaſe ſhould be from an humor putrefying and turning by putrefaction into ſome living creature, it was fit there ſhould be ſtench alſo, as being an unſeparable accident of putrefaction, for thus the excrements in the guts of which the worms are generated, do ſmell or ſtink. Naturall Melancholik humors is moſt unapt to putrefie. Stink an unſeparable companion to putrefaction.

Therefore that which exhales from their bodies which are troubled with the *Dracunculi*, ſhould be ſtinking, as it happens to thoſe ſick of the *Phthiriaſis* or *Lowſie-evill*. But none of thoſe who have delivered the accidents or ſymptomes of the *Dracunculi* are found to have made mention hereof. But for the efficient cauſe whereby ſo great heat may be raiſed in the places next under the skin, by the efficacy whereof ſuch a creature may be formed of a matter melancholick and moſt unapt to putrefie, as they make the *Dracunculus* to be who fain our bodies to be fruitfull monſters; eſpecially ſeeing the ſurface of the body is continually ventilated by the ſmall Arteries ſpread under the skin, as alſo by the benefit of inſenſible tranſpiration, and breathed with the coolneſs of the air incompaſſing us. But now the materiall and efficient cauſes being defective, or certainly very weak, for the generation of ſo laborious an effect; what coadjutory cauſe can yeeld aſſiſtance? Can the humidity of meats? for thoſe bodies which are fed with warm and moiſt meats, as milk, Cheeſe, Summer fruits, uſually breed worms, as we are taught by experience in children. What things uſually breed worms.

But on the contrary *Aviten* in the place before cited writeth, that meats of a hot and dry temper chiefly breed this kind of diſeaſe, and that it is not ſo frequent to moiſt bodies and ſuch as are accuſtomed to the Bath, moiſt meats and wine moderately taken. But whether may the condition of the air of thoſe regions in which it is as it were, an Endemiall diſeaſe, confer any thing to the generation of ſuch creatures? Certainly for this purpoſe a cloudy, warm and thick air, ſuch as uſeth to be at the beginning of the Spring when all the places reſound with frogs, toads and the like creatures breed of putrefaction.

But on the contrary *Jacobus Dalechampius* by the opinion of all the Phyſitians that have written of the *Dracunculi*, writes that this diſeaſe breeds in the dry and Sun burnt regions of *India* and *Arabia*; but if at the leaſt that part of our body which is next under the skin ſhould have any opportunity to ingender and nouriſh ſuch creatures, they may be judged to have written that the *Dracunculus* is a living creature with ſome probability. But if there be no opportunity for generation in that place, nor capacity for the nouriſhment of ſuch like *Cap. 83. Chir. Gallic.*

creatures as in the guts, if that region of the body be breathed upon with no warmneſs and ſmothering heat, if it be defiled with none of thoſe groſs excrements, as the guts uſually are, but only by the ſubtiller exhalation, which have an eaſie and inſenſible tranſpiration by the pores of the skin, which may ſeem to be a juſt cauſe of ſo monſtrous and prodigious an effect: but we ſhall little profit with theſe engines of reaſon unleſs we caſt down at once all the Bulwarkes, with which this old opinion of the *Dracunculi* may ſtand and be defended.

For firſt they ſay, why have the ancients expreſſed this kind of diſeaſe by the name of a living thing, that is, of a *Dracunculus* or little Serpent? I anſwer, becauſe in Phyſick names are often impoſed upon diſeaſes rather by ſimilitude than from the truth of the thing; for the confirmation whereof, the examples of three diſeaſes may ſuffice, that of the *Cancer*, *Polypus*, and *Elephas*. For theſe have thoſe names not becauſe any Crab, Polypus, or living Elephant may breed in the Body by ſuch like diſeaſes, but becauſe this by its propagation into the adjacents parts repreſents the feet and claws of a Crab; the other repreſents the fleſh of the Sea-Polypus in its ſubſtance; and the third becauſe ſuch as have the Leproſie have their skin wrinckled, rough, and horrid with ſcales and knots, as the skin of a living Elephant. So truly this diſeaſe of which we now enquire ſeems by good right to have deſerved the name *Dracunculus*, becauſe in its whole conformation, colour, quality and production into length and thickneſs it expreſſeth the image of a Serpent. But whence, will they ſay, (if it be without life) is that manifeſt motion in the matter? We reply that the humor the cauſe of this diſeaſe is ſubtill and hot, and ſo runs with violence into the part whence it may ſeem to move. But when the *Dracunculi* are ſeparated, why do they put their heads as it were out of their holes? We anſwer, in this the Ancients have been very much deceived, becauſe after the ſuppuration the ulcer being opened, ſome nervous body being laid bare, thruſt forth and ſubjected it ſelf to the ſight, which by the convulſive and ſhaking motion might expreſſe the crooked creeping of a Serpent. But they will ſay, pain happens not unleſs to things indued with ſenſe & life, but this *Dracunculus* when he is drawn too violently, eſpecially if he be broken, thereby will cauſe extream pain: We do anſwer, that the concluſion doth not follow & is of no conſequence, for theſe pains happen not unleſſe when the unprovident Surgeon draws or puls in ſtead of the *Dracunculus* ſome nervous or membranous body ſwoln and repleat with an aduſt humor, whence there cannot but be great pain that part being puld which is the author of ſenſe. But it is childiſh to ſay that the *Dracunculus* feels, for that it cauſeth ſharp pains to the living body in which it is. Therefore that at laſt we may determin ſomething of the nature, eſſence and generation of theſe *Dracunculi*, I dare boldly affirm it is nothing elſe but a tumor and abſceſs bred from the heat of the blood in a venenate kind. Such blood driven by the expulſive faculty through the veins to the Externall parts, eſpecially the limits, that is, the Arms and Legs, cauſeth a tumor round and long often ſtretched from the joynt of the ſhoulder even to the wriſt, or from the groin even to one of the Ankles with tenſion, heat, renitency, pricking pain, and a feaver. But this tumor is ſome while ſtretched forth ſtreight, otherwhiles into oblique and crooked tumors, which hath been the cauſe that many taken with this kind of diſeaſe, and having their limbs ſo infolded as with the twinings of a Serpent, would ſay they had a Serpent. I have thus much to ſay of the *Dracunculi*, eſpecially of thoſe of our own country.

Why they are called *Dracunculi*.

The Cure.

For the cure, it is not unlike to the cure of a Phlegmon ariſing from a defluxion, for here alſo in like manner the remedies muſt be varied according to the four times of the diſeaſe, and the ſame rule of diet, phlebotomy and purging muſt be obſerved, which is before preſcribed in the cure of a Phlegmon.

So the *Malum pilare* in *Ariſtotle cap.* 11. *lib.* 7. *hiſt. animal.*)

The mention of the *Dracunculi* cals to my memory another kind of Abſceſſe, altogether as rare. This our *French* men name *Cridones*, I think *a Crinibus*. i. from hayrs: it chiefly troubles children and pricks their backs like thorns. They toſs up and down being not able to take any reſt. This diſeaſe ariſeth from ſmall hairs which are ſcarſe of a pins length, but thoſe thick & ſtrong. It is cured with a fomentation of water more than warm, after which you muſt preſently apply an oyntment made of hony and wheaten flower; for ſo theſe hairs lying under the skin are allured and drawn forth; and being thus drawn, they muſt be plucked out with ſmall mullets. I imagine this kind of diſeaſe was not known to the ancient Phyſitians.

The End of the Eighth Book.

OF VVOUNDS INGENERALL.

THE NINTH BOOK.

CHAP. I.

What a wound is, what the kinds and differences thereof are, and from whence they may be drawn, or derived.

A Wound is a ſolution of Continuity, cauſed by a ſtroak, fall, or bite, newly done, bloody and with putrefaction and filth. They alſo call it a new ſimple ulcer; for the ſolution of continuity happens to all parts of the body; but according to the diverſity of parts, it hath divers names amongſt the Greeks. For in the fleſh it is called *Helcos*, in the bone *Catagma*, in the nerve *Spaſma*, in the ligament *Thlaſma*, in the veſſels *Apoſpaſma*, in the Muſcles *Regma*: and that ſolution of continuity, which happens in the veſſels, their mouths being open, is termed *Anaſtomaſis*, that which happens by eroſion, *Aneuroſis*; that which is generated by ſweating out and tranſcolation, *Diapedeſis*. That theſe may be the more eaſily underſtood, I have thought good to deſcribe them in the following table.

What a Wound properly is.

Divers appellations of wounds according to the varieties of the parts.

A Table of the differences of Wounds.

The differences of wounds are drawn or taken
- From the nature of the parts in which they are made or happen. But theſe parts are
  - Either ſimilar, and theſe,
    - Either ſoft, as the
      - Glandules,
      - Fleſh,
      - Fat,
      - Marrow.
    - Or hard, as
      - A Bone,
      - A Griſtle.
    - Or of a middle conſiſtence, as the
      - Membranes,
      - Ligaments,
      - Fibers,
      - Veſſels,
      - Nerves,
      - Veins,
      - Arteries.
  - Or Organicall, and theſe either
    - Principall, as the
      - Brain,
      - Heart,
      - Liver, to which ſome add the Womb and Teſticles.
    - Or ſerving the principall, as
      - The Weaſon,
      - Lungs,
      - gullet,
      - Stomach,
      - Guts,
      - Bladder.
    - Or neither
      - The Ears,
      - Noſe,
      - Feet,
      - hands, and other of the ſame kind.

from

- *From their proper essence, from whence they are called,*
  - *Simple wounds* — *When there is no complication of any other disease or symptome besides.*
  - *Or compound,* — *When there is a complication of some one or more diseases, which unlesse they be taken away, wee must not hope for to cure the wound.*
- *From their quantity according to which they are called,*
  - *Great,* — *Long, Broad, Deep.*
  - *Indifferent,*
  - *Little,* — *Short, Narrow, Superficiary.*
- *From their figure, according to which they are named,*
  - *Streight,*
  - *Oblique,*
  - *Cornered.*

CHAP. II.

Of the causes of Wounds.

Divers denominations from their causes.

ALL things which may outwardly assail the body with force and violence, may be counted the causes of wounds; which are called green, and properly bloody. These things are either animate, or inanimate. The animate, as the bitings, and prickings of beasts. The Inanimate, as the stroak of an arrow, sword, club, gun, stone, a dagger, and all such like things.

From the variety of such like causes, they have divers names: for those which are made by sharp and pricking things are called punctures: those caused by cutting things, are called wounds or gashes: and those which are made by heavy and obtuse things are named Contusions, or wounds with contusions.

CHAP. III.

Of the signs of Wounds.

A caution for making reports of Wounds.

WOunds are first known by sight, and by the signs drawn from thence. The Chirurgeon ought first and chiefly, to consider, what wounds are curable, and what not; what wounds will scarse admit of cure, and what may be easily cured; for it is not the part of a prudent Chirurgeon, to promise cure in a deadly or dangerous and difficult wound; lest he may seem to have killed him, whom not the unsufficiency of the Art, but the greatnesse of the wound hath slain.

But when the wound is dangerous, but yet without despair of recovery, it belongs to him to admonish the Patients friends which are by, of the present danger, and doubtfull state of the wound, that if Art shall be overcome by the greatnesse thereof, he shall not be thought ignorant of the Art, neither to have deceived them.

A Jugling cheating Chirurgeon.

But as this is the part and duty of a good and prudent Chirurgeon, so it is the trick of a cheating and jugling knave, to enlarge small wounds, that so he may seem to have done a great cure, when it is nothing so.

But it is agreeable to reason, that the Chirurgeon professing the disease easie to be cured, will think himself in credit bound by such promises and his duty, and therefore seek all means for the quick recovery of the Patient; lest that which was of its own nature smal, may by his negligence become great. Therefore it is expedient, he should know what wounds are to be accounted great.

Lib. 4. Meth. cap. 6. 1.

This (as *Galen* saith) is three wayes to be known; The first is by the magnitude and principality of the part affected; for thus the wounds of the Brain, Heart, and of the greater vessels, though small of themselves, yet are thought great. Then from the greatnes of the solution of continuity; for which cause wounds may be judged great, in which much of the substance of the part is lost in every dimension, though the part be one of these which are accounted servile. Then from the malignity; through which occasion the wounds of the joints are accounted great, because for the most part, they are ill conditioned.

Wounds are called great out of three respects.

CHAP.

CHAP. IIII.

Of Prognosticks to be made in Wounds.

THose Wounds are thought dangerous, wherein any large nerve, vein, or Artery are hurt. From the first there is fear of convulsion, but from the other large effusion of the veinous, or arterious blood, whence the powers are debilitated; also these are judged evill, which art upon the arm pits, groins, lesks, joynts and between the fingers; and likewise those which hurt the head or tail of a Muscle. They are lest dangerous of all other which wound only the fleshy substance. But they are deadly which are inflicted upon the Bladder, Brain, Heart, Liver, Lungs, Stomach and small guts. But if any Bone, Gristle, Nerve or portion of the cheek or prepuce, shall be cut away, they cannot be restored. Contused wounds are more difficult to cure, than those which are only from a simple solution of continuity; for before you must think to heal them up, you must suppurate and cleanse them; which cannot be done in a short time. Wounds which are round and circular are so much the worse; for there can be no unity unlesse by an angle, that is, a meeting together of two lines, which can have no place in round wounds, because a circular figure consists of one oblique line. Besides, wounds are by so much thought the greater, by how much their extreams and lips are the further disjoyned, which happens to round Wounds. Contrary to these are cornered wounds or such as are made alongst the fibers, as such as may be easily healed.

What wounds are dangerous.

What least dangerous. What deadly. *Hip. aphor.* 19. *Lib.* 6.

Why round Wounds are difficult to heal.

Wounds may be more easily healed in young men, than in old, because in them nature is more vigorous, and there is a greater plenty of fruitfull, or good blood, by which the losse of the flesh may be the better and more readily restored, which is slowlier done in an old body, by reason their blood is smaller in quantity and more dry, and the strength of nature more languid.

Wounds received in the Spring, are not altogether so difficult to heal as those taken in Winter or Summer. For all excesse of heat and cold is hurtfull to them, it is ill for a convulsion to happen upon a Wound, for it is a sign that some Nervous body is hurt; the braine suffering together therewith, as that which is the originall of the Nerves. A Tumor comming upon great Wounds is good; for it shews the force of nature is able to expell that which is harmfull, and to ease the wounded part. The organicall parts wholly cut off cannot again be united: because a vitall part once severed and plucked from the trunk of the body cannot any more receive influence from the heart as from a root without which there can be no life. The loosed continuity of the Nerves, Veins, Arteries, and also the bones, is sometimes restored, not truly, and as they say, according to the first intention, but by the second, that is, by reposition of the like, but not of the same substance. The first intention takes place in the fleshy parts by converting the Alimentary bloud into the proper substance of the wounded part. But the second, in the spermatique parts in which the lost substance may be repaired by interposition of some heterogeneous body, which nature, diligent for its own preservation, substitutes in place of that which is lost: for thus the body, which restores and agglutinates, is no bone but a *Callus*, whose originall matter is from an humor somewhat grosser than that, from whence the bones have their originall and beginning.

Hip. lib. de ulcer. Hip. aph. 66. lib. 5.

What a *Callus* is and whence it proceeds.

This humor, when it shall come to the place of the fracture, agglutinateth the ends of the bones together, which otherwise could never be so knit by reason of their hardness. The bones of children are more easily and speedily united by reason of the pliantness of their soft and tender substance. Lastly we must here admonish the Chirurgeon, that small Wounds and such as no Artisan will judg deadly, do divers times kill by reason of a certain occult and ill disposition of the wounded, and incompassing bodies; for which cause we read it observed by *Hippocrates*, that it is not sufficient for the Physitian to performe his duty, but also externall things must be rightly prepared, and fitted.

Small and contemptible Wounds often prove mortall.

Aphor. 1. sect. 1.

CHAP. V.

Of the Cure of Wounds in generall.

THe Chirurgeon ought for the right cure of wounds to propose unto himself the common and generall indication: that is, the uniting of the divided parts, which indication in such a case is thought upon and known even by the vulgar: for that which is dis-joyned desires to be united, because union is contrary to division. But by what means such union may be procured, is only known to the skilfull Artisan. Therefore we attain unto this chief and principall Indication by the benefit of nature as it were the chief Agent, and the work of the Chirurgeon as the servant of nature. And unless nature shall be strong, the Chirurgeon shall never attain to his conceived, and wished for end: therefore that he may attain hereto, he must perform five things; the first is, that if there be any strange bodies, as peeces of Wood, Iron, Bones, bruised flesh, congealed blood, or the like, whether they have come from without, or from within the body, and shall be by accident fastened or stuck in the wound, he must take them away, for otherwise there is no union to be expected.

The generall Indication of Wounds.

Five things necessary for uniting wounds.

Another is,that he join together the lips of the Wound;for they cannot otherwiſe be agglutinated and united.The third is,that he keep cloſe together the joined lips. The fourth, that he preſerve the temper of the wounded part,for the diſtemper remaining,it is impoſſible to reſtore it to its unity.The fifth is,that he correct the accidents,if any ſhall happen,becauſe theſe urging,the Phyſitian is often forced to change the order of the cure.

All ſtrange and externall bodies muſt be taken away,as ſpeedily as is poſſible,becauſe they hinder the action of nature intending unity, eſpecially if they preſs or prick any Nervous body,or Tendon,whence pain or an Abſceſs may breed in any principall part,or other ſerving the principall.

Yet if by the quick and too haſty taking forth of ſuch like bodies there be fear of cruell pain or great effuſion of blood, it will be far better to commit the whole work to nature than to exaſperate the Wound by too violent haſtening.

For nature by little and little will exclude,as contrary to it, or elſe together with the *Pus*,what ſtrange body ſoever ſhall be contained in the wounded part. But if there ſhall be danger in delay,it will be fit the Chirurgeon fall to work quickly,ſafely, and as mildly as the thing will ſuffer: for effuſion of blood,ſwooning,convulſion and other horrid ſymptomes,follow upon the too rough and boyſtrous handling of Wounds, whereby the Patient ſhall be brought into greater danger than by the Wound it ſelf.

Therefore he may pull out the ſtrange bodies,either with his fingers,or with inſtruments, fit for that purpoſe: but they are ſometimes more eaſily and ſometimes more hardly pulled forth,according as the body infixed is either hard or eaſie to be found or pulled out.Which thing happens according to the variety of the figure of ſuch like bodies, according to the condition of the part it ſelf,ſoft,hard,or deep,in which theſe bodies are faſtened more ſtraitly or more looſly: and then for fear of inferring any worſe harm,as the breaking of ſome Veſſell: but how we may perform this firſt intention, and alſo the expreſſion of the inſtruments neceſſary for this purpoſe, ſhall be ſhown in the particular treaties of Wounds made by Gun-ſhot,Arrows and the like.

Ligatures and Sutures for to conjoyn and hold together the lips of wounds.

But the Surgeon ſhal attain to the ſecond and third ſcope of curing Wounds by two and the ſame means,that is,by ligatures & ſutures:which notwithſtanding before he uſe he muſt well obſerve whether there be any great flux of blood preſent,for he ſhall ſtop it if it be too violent;but provoke it,if too ſlow,(unleſs by chance it ſhall be powred out into any capacity or belly)that ſo the part freed from the ſuperfluous quantity of blood may be leſs ſubject to inflammation.Therefore the lips of the Wound ſhall be put together,and ſhall be kept ſo joined by ſuture and ligatures: Not truly of all, but only of thoſe which both by their nature,and magnitude,as alſo by the condition of the parts in which they are, are worthy and capable of both the remedies. For a ſimple and ſmall ſolution of continuity, ſtands only in need of the Ligature which we cal incarnative,eſpecially,if it be in the Arms or Legs,but that which divides the Muſcles tranverſly,ſtands in need of both Suture and Ligature; that ſo the lips which are ſomewhat far diſtant from each other, and as it were drawn towards their beginning, and ends may be conjoyned.

If any portion of a fleſhy ſubſtance by reaſon of ſome great cut ſhall hang down, it muſt neceſſarily be adjoyned and kept in the place by Suture. The more notable and large Wounds of all the parts,ſtand in need of Suture,which do not eaſily admit a Ligature, by reaſon of the figure and ſite of the part in which they are, as the Ears, Noſe, Hairy-ſcalp, Eye-lids,lips,Belly and Throat.

Three ſorts of Ligatures.

There are three ſorts of Ligatures,by the joint conſent of all the Ancients. They commonly call the firſt, a Glutinative, or Incarnative; the ſecond Expulſive, the third Retentive. The Glutinative or Incarnative is fit for ſimple,green and yet bloody Wounds. This conſiſts of two ends, and muſt ſo be drawn, that beginning on the contrary part of the Wound, we may ſo go upwards,partly croſſing it, and going downwards again, we may cloſely joyn together the lips of the Wound. But let the Ligature be neither too ſtrait, leſt it may cauſe inflammation or pain; nor too looſe, leſt it be of no uſe, and may not well contain it.

What an Incarnative Ligature is.

What an expulſive.

The Expulſive Ligature is fit for ſanious and fiſtulous Ulcers,to preſs out the filth contained in them. This is performed with one Rowler, having one ſimple head; the beginning of binding muſt be taken from the botome of the *Sinus*, or boſome thereof; and there it muſt be bound more ſtraihgtly, and ſo by little and little going higher, you muſt remit ſome thing of that rigour, even to the mouth of the Ulcer, that ſo (as we have ſaid) the ſanious matter may be preſſed forth.

What the retentive.

The Retentive Ligature is fit for ſuch parts as cannot ſuffer ſtrait binding, ſuch are the Throat,Belly,as alſo all parts oppreſſed with pain; For the part vexed with pain, abhorreth binding.The uſe thereof, is to hold to locall Medicines. It is performed with a Rowler,which conſiſts ſomewhiles of one, ſome whiles of more heads. All theſe Rowlers ought to be of linnen,and ſuch as is neither too new,nor too old, neither too courſe, nor too fine.Their breadth muſt be proportionable to the parts to which they ſhal be applyed; the indication of their largeneſs, being taken from their magnitude, figure and ſite. As we ſhall ſhew more at large in our Tractates of Fractures and Diſlocations.

What the rowlers muſt be made of.

The

The Chirurgeon ſhall perform the firſt ſcope of curing Wounds, which is of preſerving the temper of the Wounded part, by appointing a good order of diet by the Preſcript of a Phyſitian, by uſing univerſall and locall Medicines. A ſlender, cold and moiſt Diet muſt be obſerved, untill that time be paſſed, wherein the Patient may be ſafe and free from accidents which are uſually feared. Therefore let him be fed ſparingly, eſpecially if he be plethorick; he ſhall abſtain from ſalt and ſpiced fleſh, and alſo from Wine; If he ſhall be of a cholerick or ſanguine nature: In ſtead of Wine he ſhall uſe the decoction of Barly or Liquorice, or Water and Sugar. He ſhall keep himſelf quiet; for reſt is (in *Celſus* opinion) the very beſt Medicine. He ſhall avoid Venery, Contentions, Brawls, Anger, and other perturbations of the mind. When he ſhall ſeem to be paſt danger, it will be time to fall by little and little to his accuſtomed manner and diet of life. Univerſall remedies are Phlebotomies and purging, which have force to divert and hinder the defluxion, whereby the temper of the part might be in danger of change.

Why and how the temper of the wounded part muſt be preſerved.

For Phlebotomy it is not alwayes neceſſary, as in ſmall Wounds and bodies, which are neither troubled with ill humors, or Plethorick: But it is only required in great Wounds, where there is fear of defluxion, pain, *Delirium*, Raving and unquietneſs; and laſtly in a body that is Plethorick, and when the joynts, tendons, or nerves are wounded. Gentle purgations muſt be appointed, becauſe the humors are moved and inraged by ſtronger; whence there is danger of defluxion and inflammation: wherefore nothing is to be attempted in this caſe, without the advice of a Phyſitian.

In what wounds bloodletting is not neceſſary.

The Topick and particular Medicines are Agglutinative, which ought to be indued with a drying and aſtrictive qnality, whereby they may hold together the lips of the Wound, and drive away defluxion, having alwayes regard to the nature of the part and the greatneſs of the diſeaſe. The Simple Medicines are *Olibanum*, *Aloes*, *Sarcocolla*, *Bole-Armenick*, *Terra ſigillata*, *Sanguis Draconis*, Common and Venice, Turpentine, Gum, *Elemni*, Plantane, Horſe-tail, the greater Comfery, *Parina Volatilis* and many other things of this kind, which we ſhall ſpeak of hereafter in our Antidotary.

What medicines are to be judged agglutinative.

The fifth ſcope of healing Wounds, is the correction of thoſe Symptomes or Accidents which are accuſtomed to follow Wounds, which thing verily makes the Chirurgeon have much to do; For he is often forced to omit the proper cure of the diſeaſe, ſo to reſiſt the accidents and ſymptomes, as bleeeding, pain, inflammation, a feaver, convulſion, palſie, talking idly, or diſtraction, and the like. Of which we ſhall treat briefly and particularly, after we have firſt ſpoken of Sutures as much as we ſhall think fitting for this place.

CHAP. VI.

Of Sutures.

What wounds ſtand in no need of a ſuture.

WHen Wounds are made alongſt the thighes, legs, and arms, they may eaſily want Sutures, becauſe the ſolution of continuity is eaſily reſtored by Ligatures, but when they are made overthwart, they require a Suture, becauſe the fleſh and all ſuch like parts, being cut are drawn towards the ſound parts; whereby it comes to paſs that they part the further each from other; wherefore that they may be joyned and ſo kept, they muſt be ſowed, and if the Wound be deep, you muſt take up much fleſh with your needle; for if you only take hold of the upper part, the Wound is only ſuperficially healed: but the matter ſhut up, and gathered together in the bottome of the Wound, will cauſe abſceſſes and hollow Ulcers: Wherefore now we muſt treat of making of Sutures.

The firſt maner of ſuture.

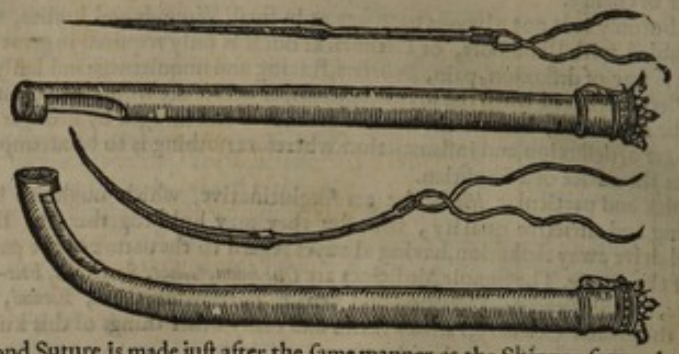
The firſt, called *Interpunctus*, leaves the diſtance of a fingers breadth, and therefore is fit for the green Wounds of the fleſhy parts, which cannot be cured with a Ligature, and in which no heterogeneous or ſtrange body remains; It is performed after this manner. You muſt have a ſmooth needle with a thred in it, having a three ſquare point, that ſo it may the better enter the skin, with the head of it ſomewhat hollowed, that the thred may lie therein; for ſo the needle will the better go through. You muſt alſo have a little pipe with a hole or window in the end, which you muſt hold and thruſt againſt the lip of the Wound, that it be not moved to the one ſide or other, whilſt you thruſt through the needle: And that we may ſee through that Window when the needle is thruſt through, and alſo draw it together with the thred, and withall hold the lip of the Wound in more firmly, that it follow not at the drawing forth of the needle and thred. Having thus pierced the lips of the Wound, tie a knot, neer to which cut off the thred; leſt that if any of it be left below the knot, it may ſo ſtick to the Emplaſters that it cannot be plucked and ſeparated from them without pain, when they are taken off. But you muſt note the firſt ſtitch muſt be thruſt through the midſt of the Wound, and then the ſecond muſt be in that ſpace which is between the midſt and one of the ends; but when you have made your ſtitches, the lips of the Wound muſt not bee too cloſely joined, but a little ſpace muſt be left open between them, that the matter may have free paſſage forth, and inflammation and pain may be avoided: otherwiſe if they ſhall be cloſely joined together without any diſtance between, a tumor after ariſing when the matter ſhall come to ſuppuration, the lips will

The form of your needle.

The form of the pipe with a window in it.

be ſo much diſtended that they may eaſily be broken by the ſtifneſs of the thred. But you muſt neither take hold of too much nor too little fleſh with your needle, for too little will not hold, and too much cauſeth pain and inflammation. And beſides leaves an ill favoured ſcar. Yet in deep wounds, ſuch as are thoſe which are made in the thicker muſcles, the needle muſt be thruſt home, that ſo it may comprehend more of the fleſhy ſubſtance; leſt the thred drawn away by the weight of the fleſh not taken hold of, may be broken. But oft-times wounds are ſeen made in ſuch places as it would be needfull, the Chirurgeon ſhould have a crooked needle and pipe, otherwiſe the Suture will not ſucceed according to his deſire. Wherefore I have thought good to ſet forth both their figures, that you may uſe either as occaſion ſhalll ſerve.

The Figure of Pipes with feneſtels in them, and Needles fit for Sutures.



The 2. means of Suture.

The ſecond Suture is made juſt after the ſame manner as the Skinner ſows their fels or furs. And the guts muſt be ſowed with this kind of Suture, (if they ſhall be at any time wounded) that the excrements come not forth by the wound.

The third manner of Suture.

The third Suture is made by one or more needles having thred in them, thruſt through the wound, the thred being wrapped to and again at the head and the point of the needle, as boyes uſe to faſten their needle, for fear of loſing it, in their caps, or clothes. This kind of Suture is fit in the curing and healing of Hare-lips, as we ſhall ſhew you hereafter expreſſed by a Figure.

The 4. kind of Suture termed *Gaſtroraphia*.

The fourth kind of Suture is termed *Gaſtroraphia*, invented for the reſtoring and uniting the great Muſcles of the *Epigaſtrium*, or lower belly, cut with a great wound together with the *Peritoneum* lying under them. The manner whereof we ſhall ſhew in due place.

The 5. kind called the Dry Suture.

The fifth kind is called the dry Suture, which we uſe only in the wounds of the face, which alſo we will deſcribe in its proper place.

CHAP. VII.

Of the flux of blood, which uſually happens in Wounds.

The ſigns of blood flowing from an artery.

Oft-times great bleeding follows upon wounds, by reaſon of ſome veſſel cut, broken, or torn, which there is need to heal and help diligently, becauſe the blood is the treaſure of nature, without which life cannot conſiſt. The blood which floweth from an Artery, is thus known. It is more ſubtile, it runs forth as it were leaping, by reaſon of the vitall ſpirit contained together with it in the Arteries. On the contrary that which floweth from a Vein is more groſs, black, and ſlow. Now there are many wayes of ſtanching blood.

The firſt way of ſtaying bleeding.

The firſt and moſt uſuall is that, by which the lips of the Wound are cloſed, and unleſs it be ſomewhat deep, are contained by Medicines which have an aſtringent, cooling, drying, and glutinous faculty; As *terræ ſigill. Boli Armeni, ana* ℥ ß, *Thuris, Maſtichis, Myrrhæ, Aloes, ana* ʒ ij, *Farinæ volat. molend.* ℥ j, *Fiat pulvis qui albumine ovi excipiatur.* Or ℞. *Thuris & Aloes, ana partes æquales*. Let them be mixt with the white of an Egge, and the down of a hare, and let the pledgets be dipped in theſe Medicines, as well thoſe which are put unto the Wound as thoſe which are applyed about it. Then let the Wound be bound up with a double clop and fit Ligature, and the part be ſo ſeated as may ſeem the leaſt tronbleſome and moſt free from pain.

The 2. manner of ſtanching it.

But if the blood cannot be ſtayed by this means, when you have taken off all that covereth it, you ſhall preſs the Wound and the orifice of the Veſſell with your thumb, ſo long untill the blood ſhall be concrete about it, into ſo thick a clot as may ſtop the paſſage.

The 3. way by binding of the veſſels.

But if it cannot be thus ſtayed, then the Suture (if any be) muſt be opened, and the mouth of the Veſſell towards the originall or root, muſt be taken hold of, and bound with your needle and thred, with as great a portion of the fleſh as the condition of the part will permit. For thus I have ſtaid great bleedings, even in the amputation of members, as I ſhall ſhew in fit place. To perform this work, we are often forced to divide the ſkin

which

which covereth the wounded veſſell. For if the Jugular vein,or Artery be cut, it will contract and with draw it ſelf upwards and downwards.Then the skin it ſelf muſt be laid open under which it lyeth,and thruſting a needle and thred under it, it muſt be bound as I have often done. But before you looſe the knot,it is fit the fleſh ſhould be grown up, that it may ſtopt the mouth of the veſſell,leſt it ſhould then bleed. An admonition

But if the condition of the part ſhall be ſuch as may forbid this comprehenſion; and binding of the veſſell, we muſt come to *Eſcharoticks*, ſuch as are the powder of burnt *Vitriol*, the powder of Mercury, with a ſmall quantity of burnt Allum; and Cauſticks which cauſe an Eſcar. The falling away of which muſt be left to nature, and not procured by art, leſt it ſhould fall away before that the orifice of the veſſell ſhall be ſtopt with the fleſh, or clotted blood. The 4 way by Eſcharoticks.

But ſometimes it happens that the Chirurgeon is forced wholly to cut off the veſſell it ſelf, that thus the ends of the cut veſſell withdrawing themſelves,and ſhrincking upwards and downwards, being hidden by the quantity of the adjacent and incompaſſing parts, the flux of the blood, which was before not to be ſtaid, may be ſtopped with leſſe labour. Yet this is an extream remedy and not to be uſed, unleſſe you have in vain attempted the former. The 5. way by cutting off the veſſels.

CHAP. VIII.

Of the pain which happens upon wounds.

THe pains which follow upon wounds ought to be quickly aſſwaged, becauſe nothing ſo quickly dejects the powers, and it alwayes cauſes a defluxion, of how good ſoever a habit and temper the body be of;for Nature ready to yeeld aſſiſtance to the wounded part,alwayes ſends more humors to it,than are needfull for the nouriſhment thereof,whereby it comes to paſſe that the defluxion is eaſily increaſed,either by the quantity,or quality,or by both. Pain weakens the body,and cauſes defluxions.

Therefore to take away this pain, the author of defluxion,let ſuch medicines be applyed to the part as have a repelling and mitigating faculty; as R.*Olei Myrtili,& Roſarum,ana* ℥ ij, *Ceræ alb.* ℥ i, *Farinæ hordei*, ℥ ß, *Ocli armeni,& terræ ſigillat. ana* ʒ vj, Melt the Wax in the oyls, then incorporate all the reſt, and according to Art, make a medicine to be applyed about the part: or R. *Emplaſt. Diacalcith.* ℥ iv, *Ole. Roſar. & aceti, ana* ℥ ß, *liquifiant ſimul*, and let a medicine be made for the fore mentioned uſe. Irrigations of oyl of Roſes and Myrtiles, with the white of an Egge, or a whole Egge added thereto,may ſerve for lenitives, if there be no great inflammation; Rowlers and double cloaths moyſtened in Oxycrate, will be alſo convenient for the ſame purpoſe. But the force of ſuch medicines muſt be often renewed, for when they are dryed,they augment the pain.But if the pain yeeld not to theſe, we muſt come to narcotick Medicines,ſuch as are the Oyl of Poppy, of Mandrake, a cataplaſm of Henbane and Sorrell,adding thereto Mallows and Marſh-mallows,of which we ſpoke formerly in treating of a Phlegmon. Divers anodynes of medicins to aſſwage pain.

Laſtly, we muſt give heed to the cauſe of the pain, to the kind and nature of the humor that flows down,and to the way which nature affects: for accordiug to the variety of theſe things,the Medicines muſt be varied,as if heat cauſe pain,it will be aſſwaged by application of cooling things; and the like reaſon obſerved in the contrary; if Nature intend ſuppuration,you muſt help forwards its indeavours with ſuppurating medicines.

CHAP. IX.

Of Convulſion by reaſon of a Wound.

A Convulſion is an unvoluntary contraction of the Muſcles (as of parts movable at our pleaſure)towards their originall, that is, the Brain and Spinall Marrow, for by this the convulſed member or the whole body (if the convulſion be univerſall)cannot be moved at our pleaſure.Yet motion is not loſt in a Convulſion as it is in a Palſie, but it is only depraved: and becauſe ſometimes the Convulſion poſſeſſeth the whole body,otherwhiles ſome part thereof,you muſt note that there are three kinds of Convulſions in generall. What a Convulſion is.

The firſt is called by the Greeks *Tetanos*, when as the whole body grows ſtiffe like a ſtake that it cannot be moved any way. Three kinds of an univerſall Convulſion.

The ſecond is called *Opiſthotonos*, which is when the whole body is drawn backwards.

The third is termed *Emproſthotonos* which is when the whole body is bended or crooked forwards.A particular Convulſion is, when as the Muſcle of the Eye,Tongue,and the like parts which is furniſhed with a Nerve, is taken with a Convulſion. Repletion or Inanition, Sympathy or conſent of pain cauſe a Convulſion. Aboundance of humors cauſe Repletion, dulling the body by immoderate eating and drinking,and omiſſion of exerciſe, or any accuſtomed evacuation, as ſuppreſſion of the Hemorrhoides, and courſes: for hence are ſuch like excrementitious humors drawn into the Nerves, with which they being replete and filled, are dilated more than is fit, whence neceſſarily becoming Three cauſes of a Convulſion. Cauſes of Repletion.

more ſhort, they ſuffer Convulſion. Examples whereof appear in Leather and Lute or Viol-ſtrings, which ſwoln with moiſture in a wet ſeaſon are broken by repletion.

Cauſes of Inanition.

Immoderate vomitings, fluxes, bleedings, cauſe Inanition or Emptineſs, wherefore a Convulſion cauſed by a wound, is deadly: as alſo by burning feavers. For by theſe and the like cauſes, the inbred & primogeneous humidity of the Nerves is waſted, ſo that they are contracted like leather which is ſhrunk up, by being held too neer the fire, or as fidle ſtrings which dryed with Summers heat, are broken with violence, ſuch a convulſion is incurable: For it is better a Feaver follow a Convulſion, than a Convulſion a Feaver; as we are taught by *Hippocrates*, *Aph.* 26. *ſec.* 2. ſo that ſuch a Feaver be proportionall to the ſtrength of the convulſitique cauſe, and the Convulſion proceed from Repletion; for the abundant and groſs humor cauſing the Convulſion is digeſted and waſted by the feaveriſh heat.

Cauſes of convulſion by conſent of pain.

The cauſes of a convulſion by reaſon of pain, are either the puncture of a Nerve, whether it be by a thing animal, as by the biting of a venemous beaſt; or by a thing inanimate, as by the prick of a needle, thorn or pen-knife; or great & piercing cold, which is hurtfull to the wounds, principally of the nervous parts; whereby it comes to paſs, that by cauſing great and bitter pain in the nerves they are contracted towards their originall, that is, the Brain, as if they would crave ſuccour from their parents in their diſtreſſed eſtate. Beſides alſo, an ill vapour carried to the brain from ſome putrefaction ſo vellicateth it, that contracting it ſelf, it alſo contracteth together with it al the Nerves and Muſcles, as we ſee it happeneth in thoſe which have the falling ſickneſs. By which it appears that not only the brain it ſelf ſuffereth together with the Nerves, but alſo the Nerves with the Brain. The ſigns of a Convulſion are difficult, painfull and depraved motions, either of ſome part or of the whole body, turning aſide of the Eyes and whole Face, a contraction of the Lips, a drawing in of the Cheeks, as if one laughed, and an univerſall ſweat.

Signs of a convulſion.

CHAP. X.

The cure of a Convulſion.

The cauſe of a Convulſion by Repletion.

The cure of a

THe cure of a Convulſion, is to be varied according to the variety of the convulſive cauſe, for that which proceeds from Repletion muſt be otherwiſe cured, than that which is cauſed by an Inanition; and that which proceeds of pain, otherwiſe than either of them. For that which is cauſed by repletion is cured by diſcuſſing and evacuating medicines: as by diet conveniently appointed, by purging, bleeding, digeſtive locall Medicines, exerciſe, frictions, ſulphurious baths and other things appointed by the preſcription of ſome learned Phyſitian which ſhall overſee the cure, which may conſume the ſuperfluous and excrementitious humors that poſſeſs the ſubſtance of the Nerves, and habit of the body. The locall remedies are Oyls, Unguents and Liniments, with which the Neck, back-bone and all the contracted parts ſhall be anointed. The Oyls are, the oyl of Foxes, Bayes, Cammomill, Worms, Turpentine, of *Coſtus*, of *Caſtoreum*: The Oyntments are *Vnguentum Arragon*, *Agrippæ*, *de Althæa*, *Martiatum*. This may be the form of a Liniment; R. *Olei chamæm. & Laurin. ana* ℥ ij, *Olei Vulp.* ℥ i, *Vnguenti de Althæa & Marti. an.* ℥ ß, *Axungiæ vulpis*, ℥ i, *Aquæ vitæ*, ℥ i ß, *Ceræ quantum ſufficit*. Make a Liniment for your uſe, or R. *Olei Lumbric. de Spica & de Caſtoreo, an.* ℥ iij, *Axung. hum.* ℥ i, *Sulphuris vivi*, ℥. ß. *Ceræ quantum ſufficit*. Make a Liniment, or R. *Vnguenti Martiati, & Agrip. an.* ℥ iij. *Olei de Terebinth.* ℥ i ß, *Olei Salviæ*, ℥ ß, *Aquæ vitæ* ℥ i, *Ceræ* ℥ i ß, *fiat linimentum*. But this diſeaſe is cured by ſlender diet, and ſweating with the Decoctions of *Guiacum*, becauſe by theſe remedies the groſs, tough, and viſcid excrements, which are in fault, are digeſted.

The cure of a Convulſion cauſed by inanition.

A Convulſion proceeding of Inanition is to be cured by the uſe of thoſe things, which do wholeſomly and moderately nouriſh. And therefore you muſt preſcribe a diet conſiſting of meats full of a good nouriſhment, as broaths and cullices of Capons, Pigeons, Veal, & Mutton, boyling therein Violet and Mallow leaves. Conſerves muſt be ordained, which may ſtrengthen the debilitated powers, and humect the habit of the body, ſuch as are, the Conſerves of Bugloſs, Violets, Borage and water Lillies. The following broath will be profitable, R. *Lactucæ, Bugloſ. & portul. an M* i, *quatuor ſeminum frigid. major. an.* ℥ ß, *ſeminis Berberis* ℥ i. Let them all be boyled with a chicken, and let him take the broath every morning. If thirſt oppreſs him, the following Julep will be good. R. *Aquæ roſar.* ℥ iv, *Aquæ viol.* ℔ ß, *Saccari albiſſimi* ℥ vi. *fiat Julep, utatur in ſiti*. If the Patient be bound in his body, emollient and humecting Clyſters ſhall be appointed, made of the decoction of a ſheeps head and feet, Mallows, Marſh Mallows, Pellitory of the wall, Violet leaves, and other things of the like faculty; or that the remedy may be more ready and quickly made: let the Clyſters be of Oyl and Milk. Topick remedies ſhall be Liniments and Baths. Let this be the example of a Liniment.

An Emollient Liniment for any Convulſion

R. *Olei Viol. & Amygdal. dulc. an.* ℥ ij, *Olei Lilior. & Lumbric. an.* ℥ i, *Axungiæ porci recentis*, ℥ iij, *Ceræ novæ quantum ſufficit, fiat Linimentum*, with which let the whole ſpine and part affected be anointed: This ſhall be the form of an emollient and humecting bath.

An Emollient and humecting bath.

R. *Fol. Malvæ, Bis Malvæ, Pariet. ana M* vi, *Seminis Lini & fœnug. ana* ℔ ß, *Coquantur in aqua communi, addendo Olei Lilior.* ℔ viij. Make a Bath: into which let the Patient enter when it is warm. When he ſhall come forth of the Bath, let him be dried

with

with warm clothes,or reſt in his bed avoiding ſweat. But if the patient be able to undergo the charge, it will be good to ordain a bath of milk, or oyl alone, or of them equally mixt together.

CHAP. XI.

Of the cure of a Convulſion, by ſympathy and pain.

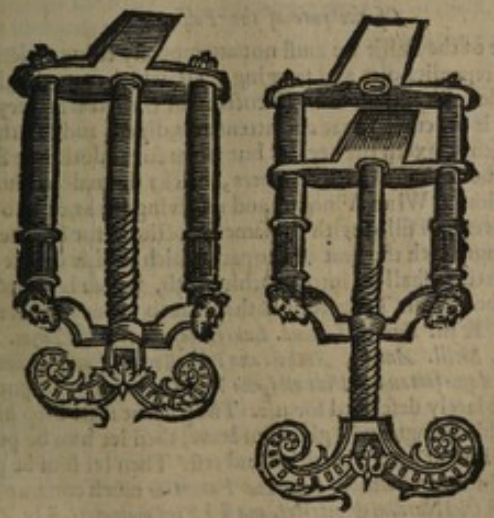
A Convulſion which is cauſed both by conſent of pain and Communication of the affect, is cured by remedies which are contrary to the dolorifick cauſe. For thus if it proceed from a puncture or venemous bite, the wound muſt be dilated and inlarged by cutting the skin, that ſo the venenate matter may flow forth more freely, for which purpoſe alſo medicines which are of a thin and liquid conſiſtence,but of a drying and digeſtive faculty ſhall be powred in, to call forth and diſſolve the virulency, as Treacle and Mithridate,diſſolved in *Aqua vitæ*,with a little of ſome mercuriall powder: for this is a noble antidote. Alſo cupping glaſſes and ſcarifications will be good. Laſtly, the condition of all dolorifick cauſes, ſhall be oppugned by ths oppoſition of contrary remedies,as if pain by reaſon of a pricked nerve or tendon,ſhall cauſe a Convulſion,it muſt preſently be reſiſted by proper remedies, as oyl of Turpentine, of *Euphorbium*,mixt with *Aqua vitæ*,and alſo with other remedies appropriated to punctures of the nerves. If the pain proceed from exceſs of cold, becauſe cold is hurtfull to the brain, the ſpinall marrow, and nerves; the patient ſhall be placed in a hot air, ſuch as that of a hot-houſe,or ſtoave,all the ſpine of his back and convulſed parts, muſt be anointed with the hot liniments above mentioned: for that is much better, than ſuddenly to expoſe him from the conceived convulſifick cauſe to a moſt hot fire or warm Bath. In the mean time the Chirurgeon muſt take diligent heed,that as ſoon as the ſigns of the Convulſion to come, or already preſent,or at hand,do ſhew themſelves, that he put a ſtick between the patients teeth, leſt they be faſt locked by the pertinacious contraction of the Jaws: for many in ſuch a caſe have bit off their tongues,for which purpoſe he ſhall be provided of an inſtrument called *Speculum Oris*, which may be dilated and contracted according to your mind by the means of a ſcrew,as the figures underneath demonſtrate, the one preſenting it open and ſomewhat twined up, and the other as it is ſhut.

The Cure of a Convulſion by a puncture,or bite.

A worthy *Alexipharmacum* or Antidote.

You muſt hinder the locking of the teeth.

The Figure of a Speculum Oris, *to open the teeth when they are locked or held faſt together.*



CHAP. XII.

Of the Palſie.

THe Palſie is the reſolving or mollification of the nerves, with privation of ſenſe and motion, not truly of the whole body,but of the one part thereof,as of the right or left ſide. And ſuch is properly named the Palſie: for otherwiſe and leſs properly the reſolution of ſome one member is alſo called the Palſie: for when the whole body is reſolved,it is an Apoplexy. Therefore the Palſie ſometimes takes half the body,otherwhiles the upper parts which are between the navell and the head, otherwhiles

What a Palſie is.

The differences thereof.

therwhiles the lower which are from the navell to the feet; ſometimes the tongue, gullet, bladder, yard, eyes; and laſtly, any of the particles of the body.

How it differs from a Convulſion.

It differs from a Convulſion in its whole nature. For in a convulſion, there is a contention and contraction of the part, but in this a reſolving and relaxation thereof: beſides, it commonly happeneth that the ſenſe is either aboliſhed or very dull, which uſually remains perfect in a Convulſion. There are ſome which have a pricking, and as it were great pain in the part.

The cauſes.

The cauſes are internall or externall, the internall are humors obſtructing one of the ventricles of the brain, or one ſide of the ſpinall marrow, ſo that the animall faculty, the worker of ſenſe and motion, cannot by the nerves come to the part to perform its action. The externall cauſes are a fall, blow, and the like injuries, by which oft-times the joints are diſlocated, the ſpinall marrow wreſted aſide, and conſtrictions and compreſſions of the *Vertebræ* ariſe, which are cauſes that the animall ſpirit cannot come to the Organs in its whole ſubſtance. But it is eaſy by skill in Anatomy perfectly to underſtand by the reſolved part the ſeat of the morbifick cauſe, for when there is a Palſie properly ſo called, that is, when the right or left ſide is wholly ſeized upon, then you may know that the obſtruction is in the brain, or ſpinall marrow; but if the parts of the head being untoucht, either of the ſides being wholly reſolved, the fault remains in the originall of the ſpinall marrow; if the armes be taken with this diſeaſe, we may certainly think that the matter of the diſeaſe lies hid in the fifth, ſixth, and ſeventh *Vertebra* of the neck. But if the lower members languiſh, we muſt judge the Paralytick cauſe to be contained in the *Vertebræ* of the loins and holy bone. Which thing the Chirurgeon muſt diligently obſerve that he may alwaies have recourſe to the originall of the diſeaſe. The Palſie which proceeds from a nerve cut, or exceedingly bruiſed, is incurable, becauſe the way to the part by that means is ſhut againſt the animall ſpirit. Old men ſcarce or never recover of the Palſie, becauſe their native heat is languid, and they are oppreſſed with abundance of excrementitious humors; neither doth an inveterate Palſie which hath long poſſeſt the part, neither that which ſucceeds an Apoplexy, yeeld us any better hope of cure. It is good for a feaver to come upon a Palſie, for it makes the diſſipation of the reſolving and relaxing humor, to be hoped for. When the member affected with the palſie, is much waſted, and the oppoſite on the contrary, much encreaſed in quantity, heat and colour, it is ill: for this is a ſigne of the extream weakneſs of the afflicted part, which ſuffers it ſelf to be defrauded of its nouriſhment, all the proviſion flowing to the ſound or oppoſite ſide.

It is good for a feaver to happen upon a palſie.

CHAP. XIII.

Of the cure of the Palſie.

The decoction of *Guaiacum* is good for a palſie.

Things actuall by hot good for to be applied to paralytick members.

IN the cure of the Palſie we muſt not attempt any thing, unleſs we have firſt uſed generall remedies, diet and purging; all which care lyeth upon the learned and prudent Phyſitian. The Decoction of *Guaiacum* is very fit for this purpoſe, for it procures ſweat and attenuates, digeſts and drieth up all the humidity which relaxeth the nerves: but when ſweat doth not flow it ſhall not be unprofitable to put about the reſolved members, bricks heated red hot in the fire and quenched in a decoction of Wine, Vinegar, and reſolving herbs, or alſo ſtone bottles, or Ox and Swine bladders, half filled with the ſame decoction; for ſuch heat which is actuall reſuſcitateth and ſtrengthneth the heat of the part, which in this diſeaſe is commonly very languid: Then the patient ſhall go into a bathing-tub, which is vailed or covered over juſt as we have deſcribed in our Treatiſe of Baths, that ſo he may receive the vapour of the following decoction. ℞ *ſol. Salviæ, Lavend. Lauri. major. Abſinth. Thym. Angelicæ, Rutæ, ana M.ß. Florum Chamæm. Melil. Anethi, Anthoſ. ana P ij. Baccar. Laur. & Iuniper. Conquaſſatar. ana ℥ j. Caryophyl. ℥ ij. Aquæ fontanæ & Vini albi, ana* ℔iv. Let them be all put in the veſſel mentioned in the Treatiſe lately deſcribed for uſe. The patient ſhall keep himſelfe in that Bathing-tub, as long as his ſtrength will give him leave, then let him be put into his bed wel covered, where he ſhall ſweat again, be dried and reſt. Then let him be preſently anointed with the following ointment, which *Leonellus Faventius* much commends, ℞ *Olei Laurini & de Terebinth. ana* ℥ iij. *Olei Nardini & petrolei, ana* ℥ j. *Vini malvatici,* ℥ iv. *Aquæ vitæ* ℥ij. *Pyrethri, Piperis, Sinap. Granor. Junip. Gummi hederæ, anacard. Ladani puri, an.* ℥ jß. *Terantur & miſceantur omnia cum Oleis & Vinobulliant in vaſe duplici uſque ad Vini conſumptionem, facta forti expreſſione, adde Galbani, Bdellii, Euphorbii, Myrrhæ, Caſtorei, adipis urſi, Anatis, Ciconiæ, an.* ℥ij. Make an ointment in form of a liniment, adding a little wax if need ſhall require. Or you ſhall uſe the following remedy approved by many Phyſitians. ℞ *Myrrhæ & Aloes, Spicæ nardi, Sanguinis draconis, thuris, opoponacis, bdellii, Carpobalſami, amomi, ſarcocollæ, croci, maſtic. gummi arabici, ſtyrac. liquidæ, ladani, caſtorei, ana* ℥ij. *Moſchi,* ℥j. *Aqua vitæ,* ℥ j. *Terebinthinæ venetæ, ad pondus omnium, pulverabuntur pulveriſanda & gummi eliquabuntur cum aqua vitæ & aceti tantillo.* And let them all be put in fit veſſels, that may be diſtilled in *Balneo Mariæ*, and let the ſpine of the back, and paralytick limbs be anointed with the liquor which comes from thence. I have often tried the force of this following Medicine. ℞ *rad. Angel. Ireos. floren. gentian. cyperi, ana* ℥j. *Calami aromat. Cinnam.*

Leon. Faventius his ointment.

An approved ointment for the palſie.

nam. Caryophil. nucis Moſch. macis, ana ʒij. *Salviæ major. Iuæ arthriticæ, Lavend. roriſm. ſaturein, pulleg. calament. mentaſtri, ana M* ß. *florum chamem. melil. hyperic. anthos, ſtœchad. ana* P j. *Conciſa omnia contundantur, & in Aquæ vit. & Vini malvat. an.* lbij. *infundantur.* And let them be diſtilled in *Balneo Mariæ*, like the former let the affected parts be moiſtned with the diſtilled liquor, of which alſo you may give the patient a ſpoon full to drink in the morning with ſome Sugar. For thus the ſtomach will be heated, and much phlegm contained therein as the fuel of this diſeaſe, will be conſumed.

A diſtilled water good to waſh them outwardly, & to drink inwardly.

You muſt alſo appoint exerciſes of the affected parts, and frequent and hard friſtions, with hot linnen clothes, that the native heat may be recalled and the excrements contained in the parts digeſted: you may alſo uſe the Chymicall oyls of Roſemary, Tyme, Lavander, Cloves, Nutmegs; and laſtly, of all ſpices, the manner of extracting whereof we ſhall hereafter declare in a peculiar Treatiſe.

Exerciſes and friſtions. Chymical oyls.

CHAP. XIV.

Of Sowning.

SOwning is a ſodain and pertinacious defect of all the powers, but eſpecially the vitall; in this the patients lie without motion and ſenſe, ſo that the Ancients thought that it differed from death only in continuance of time. The cauſe of ſowning, which happens to thoſe that are wounded is bleeding, which cauſeth a diſſipation of the ſpirits: or fear, which cauſeth a ſodain and joint retirement of the ſpirits to the heart. Whence follows an intermiſſion of the proper duty, as alſo of the reſt of the faculties, whilſt they being thus troubled, are at a ſtand. Alſo Sowning happens by a putrid and venenate vapour, carried to the heart by the arteries, and to the brain by the nerves; by which you may gather, that all ſowning happens by three cauſes. The firſt is, by diſſipation of the ſpirits and native heat, as in great bleeding. And then by the oppreſſion of theſe ſpirits by obſtruction, or compreſſion, as in fear, or tumult; for thus the ſpirits fly back haſtily from the ſurface and habit of the body, unto the heart and center. Laſtly, by corruption, as in bodies filled with humours, and in poyſonous wounds. The ſigns of ſowning are paleneſs, a dewy and ſodain ſweat ariſing, the failing of the pulſe, a ſodain falling of the body upon the ground without ſenſe and motion, a coldneſs poſſeſſing the whole body, ſo that the patient may ſeem rather dead, than alive. For many of theſe who fall into a ſown die unleſs they have preſent help.

What ſowning is.

Three cauſes of ſowning.

Therefore you ſhall help them, if when they are ready to fall, you ſprinkle much cold water in their face, if that the ſowning happen by diſſipation of the ſpirits, or if they ſhal be ſet with their faces upwards, upon a bed or on the ground, as gently as may be; and if you give them bread dipt in wine to hold and chew in their mouths. But if it be cauſed by a putrid vapour and poyſonous air, you ſhall give them a little Mithridate or Treacle in *Aqua vitæ* with a ſpoon, as I uſually do to thoſe which have the plague, or any part affected with a Gangrene, or ſpacell. But if the patients cannot be raiſed out of their ſownes, by reaſon of the pertinacious oppreſſion and compreſſion of the ſpirits about the heart, you muſt give them all ſuch things as have power to diffuſe, cal forth and reſuſcitate the ſpirits, ſuch as are, ſtrong wines to drink, ſweet perfumes to ſmell: You muſt call them by their own name lowd in their eare, and you muſt pluck them ſomewhat hard by the hairs of the Temples, and neck. Alſo rub the temples, noſtrils, wriſts and palms of the hands with *Aquæ vitæ*, wherein Cloves, Nutmegs, and Ginger have been ſteeped.

The cure of ſowning cauſed by diſſipation of ſpirits.

The cure of ſowning cauſed by a venenate air.

The cure of ſowning cauſed by oppreſſion & obſtruction.

CHAP. XV.

Of Delirium (i.) *Raving, Talking idly or Doting.*

DOting or talking idly, here is uſed for a ſymptome which commonly happeneth in feavers cauſed by a wound, and inflammation; and it is a perturbation of the phantaſie, and function of the mind, not long enduring. Wherefore ſuch a doting happens upon wounds, by reaſon of vehement pain, and a feaver, when as the nervous parts as the joints, ſtomach, and midriffe, ſhall be violated.

What a ſymptomaticall *Delirium* is. The cauſes thereof.

Why the brain ſuffers with the midriffe.

For the Ancients did therefore call the Middriffe *Phrena*, becauſe when this is hurt, as if the mind it ſelf were hurt, a certain phrenſie enſues; that is, a perturbation of the animall faculty, which is imployed in ratiocination; by reaſon of the community which the *Diaphragma* hath with the brain, by the nerves, ſent from the ſixth conjugation, which are carried to the ſtomach. Therefore doting happens by too much much bleeding, which cauſeth a diſſipation of the ſpirits, whereby it happens that the motions and thoughts of the mind erre, as we ſee it happens to thoſe who have bled much in the amputation of a member. And it happens by the puncture of a venemous beaſt, or from ſeed retained or corrupted in the womb, or from a Gangrene or Sphacel, from a venenate and putrid air carried up to the brain, or from a ſodain tumult & fear. Laſtly, what things ſoever with any diſtemper eſpecially hot, do hurt and debilitate the mind. Theſe may cauſe doting by the afflux

The Cure.

of

of humors, ſpecially cholerick, by diſſipation, oppreſſion or corruption of the ſpirits. Therefore if it ſhall proceed from the inflammation of the brain, and *Meninges* or membranes thereof; after purging and blood-letting by the preſcription of a Phyſitian, the hair being ſhaved or cut off, the head ſhall be fomented with roſe vinegar, and then an Emplaiſter of *Diacalcitheos* diſſolved in oyl and vinegar of Roſes, ſhall be laid thereupon. Sleep ſhall be procured with Barly creams, wherein the ſeeds of white Poppy have been boiled, with broths made of the decoction of the cold ſeeds of Lettuce, Purſlain, Sorrell, and ſuch like. Cold things ſhall be applyed to his noſtrills, as the ſeeds of Poppy gently beaten with Roſe water and a little vinegar. Let him have merry and pleaſant companions that may divert his mind from all cogitation of ſorrowful things, and may eaſe and free him of cares, and with their ſweet intreaties may bring him to himſelf again. But if it happen by default of the ſpirits, you muſt ſeek remedy from theſe things which have been ſet down in the Chapter of Sowning.

The End of the Ninth Book.

OF THE GREENE AND BLOODY VVOVNDS OF EACH PART.

THE TENTH BOOK.

CHAP. I.

Of the kinds or differences of a broken skull.

NOw that we have briefly treated of wounds in generall, that is, of their differences, ſigns, cauſes, prognoſticks and cure, and alſo ſhewed the reaſon of the accidents and ſymptoms which uſually follow and accompany them, it remains that we treat of them as they are incident to each part, becauſe the cure of wounds muſt be diverſly performed according to the diverſity of the parts. Now we will begin with the wounds of the head. Therefore the head hath the hairy ſcalp lightly bruiſed without any wound, otherwhiles it is wounded without a Contuſion, and ſometimes it is both contuſed and wounded: but a fracture made in the skull, is ſometimes ſuperficiary, ſometimes it deſcends even to the *Diploe*, ſometimes it penetrates through the 2 Tables, and the Meninges into the very ſubſtance of the brain; beſides, the brain is oft-times moved and ſhaken with breaking of the internall veins, and divers ſymptoms happen when there appears no wound at all in the head: of all and every of which we will ſpeak in order, and add their cure, eſpecially according to the opinion of the divine *Hippocrates*. He in his Book of the wounds of the head, ſeems to have made 4 or 5 kinds of fractures of the skull. The firſt is called a fiſſure or fracture, the 2 a contuſion or colliſion, the 3 is termed *Effractura*, the 4 is named *Sedes*, or a ſeat; the 5 (if you pleaſe to add it) you may call a Counterfiſſure, or as the interpreter of *Paulus* cals it, a *Reſonitus*. As when the bone is cleft on the contrary ſide, to that which received the ſtroak. There are many differences of theſe 5 kinds of a broken skul. For ſome fractures are great, ſome ſmall, and others indifferent; ſome run out to a greater length or bredth; others are more contracted; ſome reſide only in the ſuperficies; others deſcend to the *Diploe*, or elſe pierce through both the Tables of the skull; ſome run in a right line, others in an oblique and circular; ſome are complicated amongſt themſelves, as a fiſſure is neceſſarily and alwaies accompanied with a Colliſion or Contuſion; and others are aſſociated with divers accidents, as pain, heat, ſwelling, bleeding and the like. Sometimes the skull is ſo broken, that the membrane lying under it, is preſſed with ſhivers of the bone, as with pricking needles. Somewhiles none of the bones falls off. All which differences are diligently to be obſerved, becauſe they force us to vary the cure, and therefore for the help of memory, I have thought good to deſcribe them in the following Table.

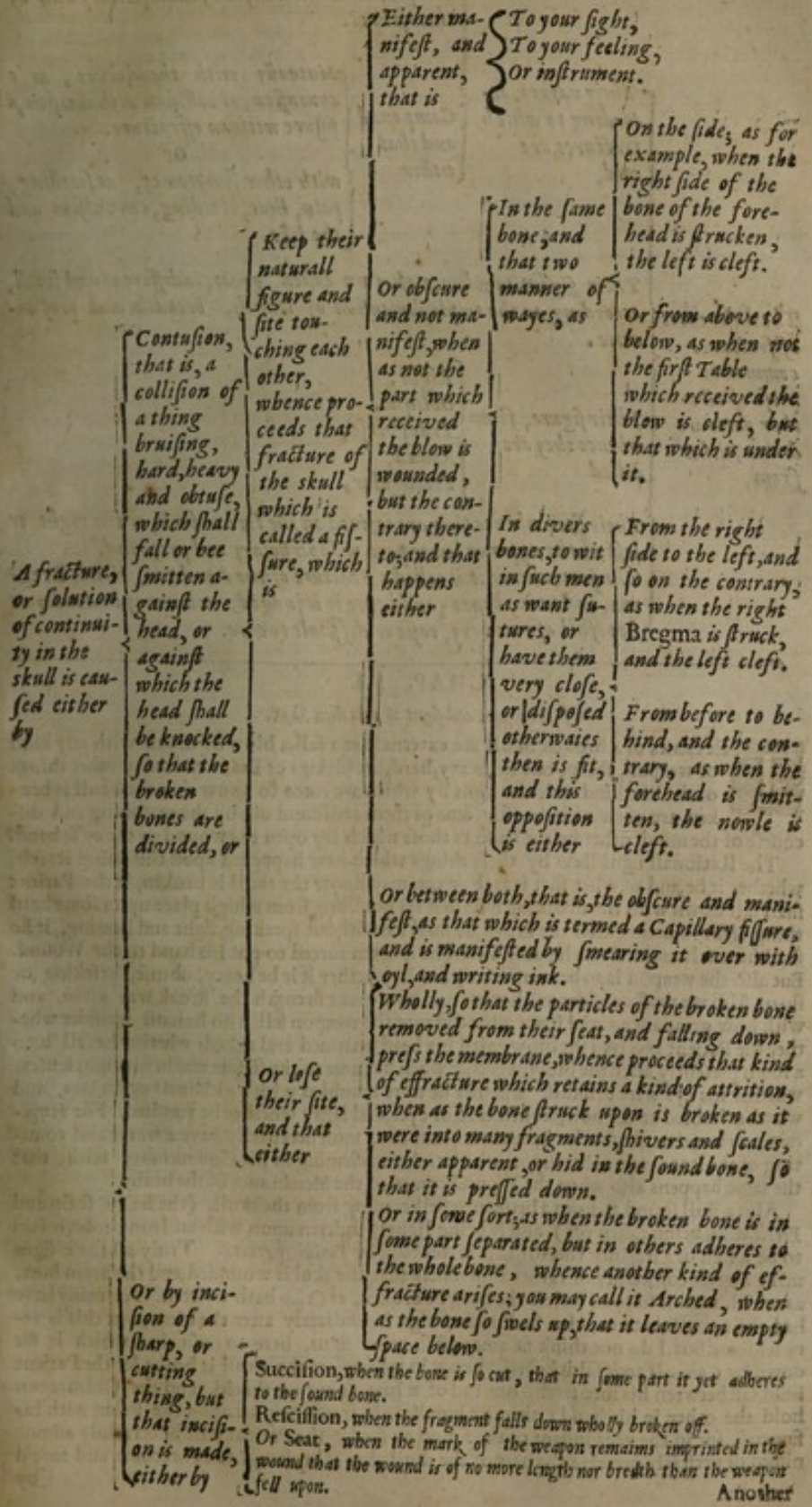
The differences of a broken head.

The kinds of a broken Skull out of *Hippocrates*.

Differences from their quantity.
Differences from their figure.
From their complication.

A

A Table of the fractures of the Skull.



Another

Another Table of the differences of a fractured Skull.

- *The differences of fractures common to these of all other parts are drawn, either from*
  - *Their nature, according to which fractures are cald,*
    - *Simple, as when they are found solitary and by themselves.*
    - *Compound and that either*
      - *Mutually with themselves, as a contusion, or collision with incision, a fissure with an effracture.*
      - *Or*
      - *with other symptomes, as swelling, pain, heat, bleeding, convulsion and the like.*
  - *Their Quantity, whence they are called, great, indifferent and small, according to the triple dimension of length, breadth and profunditie.*
  - *Their figure, from whence they are called*
    - *Right,*
    - *Oblique,*
    - *Transverse,*
    - *Round,*
    - *Triangular.*
  - *Their site, whence they are termed on the fore or back, or the right or left, or the upper or lower part, or superficiary and profound.*
  - *The part, whence it is called a Fracture of the Forehead, Nowl, Bregma, and Stony bones; and hence it is judged, what may be deadly or hopefull of recovery, easie or difficult to cure.*

CHAP. II.

Of the causes and signs of a broken Skull.

The extetnall causes.

THe causes of a broken Skull are externall, as a fall, a blow or stroak with any kind of weapon, sharp, obtuse, heavy, hard, the bitings of Beasts and many other things of the like kind. But the signs by which we come to know that the Skull is broken, are of two kinds; for some of them are found out by the reasoning and discourse of the mind, other by the sense, as those which lay open the wound to the ey & hand.

Rationall causes.

The Rationall signs shew by these things which have happened upon the thing it self, whether it be, and of what sort it is. For you may know the skull is broken, if the Patient shall fall down with the stroak, or if he shal fal headlong from a high place upon some hard thing. If for sometime after the stroak, he shall lie without speaking, sight and hearing, if he shall have felt and feel much pain, so that he is often forced to put his hand to the Wound. But also the weapon is to be considered, that is, whether if it be heavy, obtuse, pricking or sharp. Also we must consider with what and how great strength the stroak was given, and with how great anger and from what distance the weapon fell. Also he must consider whether the Patient received the blow; with his head unarmed and naked; whether he fell into a sown presently after the blow; whether when he came to him self, he was in his right senses; whether his eys were blinded, whether he were troubled with a giddiness or dizines, and whether he bled at the nose, mouth, ears, or eyes, and lastly whether he vomited. For *Hippocrates* wriees, that those who have their brain cut, must necessarily have a feaver and vomiting of choler to ensue thereupon, which *Galen* confirming in his Commentary saith, that the same happens also when the Wound comes to the Membranes of the brain.

Aphor. 50. sec. 6.

Also a dull sound as from a broken vessell coming from the skull, (the hairy scalp and *Pericranium* being taken off) and it being lightly smitten upon with an Iron probe, is said to be a sign of a fracture thereof, as it is recorded by *Paulus Ægineta*. Truly all these signs make a great conjecture or rather assuredness that the skul is wounded, and the brain hurt, as which cannot happen unless the bone be broken, as *Celsus* hath written. Yet many have had their skulls broken, who had no such sign immediately after the blow, but this is very seldome. But I do not think fit amongst so many signs, here to omit that which is set down by *Guido*. If any (saith he) will know in what place the skull is broke, let the Patient hold fast between his fore teeth, one end of a lute string or thread, and the Chirurgeon hold the other in his hand; then let him lightly touch or play upon the string with his fingers; for in the very instant of the sound or stroke, the Patient will be certainly admonished, or perfectly perceive the part of the skull that is broken, and as orecome and forc'd

Lib. 8. cap. 4.

by

by this ſenſe of pain, will by lifting up his hand make demonſtration thereof. As yet I have not been able to find the truth hereof by experience, although I have made tryall of it in many. Wherefore I cannot ſay any thing certainly of this ſign, as neither of that which is mentioned by *Hippocrates* in *Coac. Præſ.* In ſuch as you doubt, whether the bones of the skull be broken, or not, you muſt judg by giving them the ſtalk of the Aſphodill, to chaw on both ſides of their jaws, but ſo that you bid them withall obſerve, whether they perceive any bone to crackle, or make a noiſe in their heads, for theſe which are broken ſeem to make a noiſe.

Hippocrates and *Guidoes* conjecturall ſigns of a broken skull.

But paſſing over theſe things, now let us come to theſe ſigns, which may be obvious to our ſenſes.

CHAP. III.

Of the ſigns of a broken skull, which are manifeſt to our ſenſe.

THeſe ſigns are here ſaid to be manifeſt to ſenſe, which when the bone is bared, manifeſt the wound to our eyes, fingers and probe. But if the hairs ſtand upon one end in the wound, you may know the bone is broke, becauſe the hair which yeelds to the violence of the blow, cannot be ſo cut, the bone which reſiſts the ſtroak being not violated, as it is obſerved by *Hippocrates*; wherefore we may by the ſight of this one thing, before any inſpection of the wound it ſelf, ſuſpect by a probable conjecture, that the skull is broken, and perſwade the beholders or ſtanders by ſo much.

Senſible ſigns of a broken skull before the dividing of the skin. *Lib. de vulner. cap.*

Moreover we may, before we have cut the skin acroſs, or laid bare the bone, give a gueſs by our feeling, whether the skull be broken, or no, if we by preſſing down our fingers neer the wound ſhall perceive the bone either to ſtand up, or be preſſed down otherwiſe than it ſhould naturally be.

The skin being cut croſwiſe and the bone laid bare, if the fracture be not obvious to the eye, you muſt try with your probe, which muſt neither be too thin nor too ſharp, leſt by falling into ſome naturall cranies, it may cauſe us to ſuſpect without any cauſe that the bone is broken; neither let it be too thick, leſt the little clifts may deceive you. If when your probe comes to the bone, it meets with nothing but that which is ſmooth and ſlippery, it is a ſign that it is whole.

What a probe muſt be uſed in ſearching for a fracture.

But on the contrary if you find it any thing rough, ſpecially where there is no future, it ſhews the bone is broken. But let the Chirurgeon conſider, that the fractures are not ſeldom upon the ſutures; and that the ſutures have not alwayes one and their naturall ſite; as alſo it often comes to paſs that the broken cleft, or cut bone can neither be perceived by your ſight, nor inſtrument; wherefore if you think there is any ſuch thing, by the rationall ſigns above mentioned; anoint the place with writing Ink, and oyl, and ſo you ſhall find the crack or clift, by the means we ſhall ſhew you hereafter.

When you are certain of the fracture, then you muſt diligently conſider the greatneſs of the diſeaſe, and apply medicines ſpeedily. Verily when a fracture chances to light upon any future, the diſeaſe is hard to be known, unleſs the fracture be very great, becauſe the ſutures by their clifts and roughneſs reſemble fractures; wherefore *Hippocrates* ſaith that he was deceived by them. Now having briefly delivered the differences and ſigns of a broken skull, it is time to come to the ſeverall kinds thereof, with a Fiſſure.

Lib. 5 Epid. in Autonomus of Omilus Hippocrates was deceived by the ſutures.

CHAP. IIII.

Of a Fiſſure, being the firſt kind of a broken Skull.

IF the Chirurgeon by the forementioned ſigns ſhall know that the skull is broken, or crackt, and if the wound made in the muſculous skin ſhall not be thought ſufficient for ordering the fiſſure, then muſt he ſhave off the hair, and cut with a razour, or inciſion knife, the muſculous skin with the *Pericranium* lying under it, in a triangular or quadrangular figure to a proportionable bigneſs, alwayes ſhunning as much as in him lyes, the ſutures and temples; neither muſt he fear any harm to enſue hereof; for it is far better to bare the bone by cutting the skin, then to ſuffer the kind & nature of the fracture to remain unknown, by a too religious preſervation of the skin; for the skin is cured without any great ado, though pluckt off to no purpoſe.

Upon what occaſion the hairy ſcalpe muſt be cut.

Celſus.

For it is much more expedient (in *Hippocrates* opinion) to cure diſeaſes ſafely and ſecurely, though not ſpeedily, than to do it in a ſhorter time with fear of relapſe and greater inconveniencies. Let this diſſection be made with a razour, or ſharp knife, and if there be any wound made in the skin by the weapon, let one of your inciſions be made agreeable thereto.

Hippocrates.

A Razour, or Inciſion Knife.

The manner how to pull the hairy ſcalp from the broken skull.

Now therefore the Muſculous skin together with the *Pericranium* muſt be divided and cut with a ſharpe razour preſſed and guided with a ſtrong and ſteddy hand;then it muſt be ſo pluckt from the bone,or skull lying under it,that none thereof remain upon the bone; for if it ſhould be rent or torn with the Trepan,it would cauſe vehement pain with inflammations. You muſt begin to pull it back at the corners of the lines croſſing each other with right angles,with this Chiſſell whoſe figure you ſee here expreſſed.

A Chiſſell or Inſtrument to pull back or or ſeparate the Pericranium *from the skull.*

Then you muſt fill all the wound with boulſters of fine ſoft lint, that ſo the lips may be kept further a ſunder. But you ſhall apply upon it medicines fit to ſtanch blood. But if it come ſo to paſs that the blood flows forth ſo violently,that it can be ſtayed by no means, the veſſell it ſelf muſt be bound, after this manner.

The manner to bind a veſſell in caſe of too much blee'ding.

Firſt thruſt through the muſculous skin on the outſide with a needle and thred, then thruſt the needle back again; then tye the thred on a knot on the outſide, but firſt put ſome lint rolled up to the bigneſs of a Gooſe quill between the thred and the hairy ſcalp on both ſides thereof, leaſt the ſtrait twitching of of the thred which may ſerve to ſtay the bleeding, may cut and tear the skin, or cauſe pain: then muſt you raiſe his head ſomewhat higher.

A Hiſtory.

I have lately tried,and performed this upon a certain Coach-man,who thrown from the Coach upon his head on a pavement of free ſtone,exceedingly bruiſed the hind part of the *Bregma*, for which cauſe it was fit to open the muſculous skin, with a croſs inciſion, both that the congealed blood might be preſſed out, as alſo that the fracture (if there were any) might be obſerved. But an Artery being cut in performance hereof, when as the Chirurgeon who was there preſent could not ſtay the blood leaping out with violence; and the Coachman already had loſt ſo great a quantity thereof, that his ſtrength was ſo much decayed,that he could not ſtir himſelf in his bed, or ſcarſe ſpeak: I being called,ſhewed them by experience, that whereas aſtringent medicines were uſed before to no purpoſe,it was better to ſtay the bleeding by binding the veſſell,than to let the Patient dye for;a childiſh fear of pricking him.

A way to find a fracture in the skull, when it preſents not it ſelf to the view at the firſt.

But that we may return to our former matter,the Chirurgeon ſhall the next day conſider with what kind of fracture the bone is hurt; and if no ſigns of hurt appear to the eyes,nor be perceived with your fingers and probe, yet ſome of the rationall ſigns may cauſe one to have a conjecture that there is a fracture: Then you muſt anoint as we told you before,the bared done with writing Ink, and a little oyl of Roſes; that the cleft or crack may be dyed or coloured therewith, if that there be any there. Then the next dreſſing you muſt dry the bone with a linnen cloth,and ſcrape off the Ink, and oyl, with ſcraping Inſtruments made for the purpoſe, if any part thereof ſhall be ſunk into the bone; for if there be any crack; it will be black; Wherefore you muſt continue ſcraping untill no ſign of the fiſſure remain, or elſe untill you come even to the *Dura Mater*. But that he may be more certain whether the fiſſure pierce through both the Tables of the skull,he muſt bid the Patient,that ſtopping his noſe and mouth,he ſtrive to breath with a great indeavour. For then bloody matter or *ſanies* will ſweat through the fiſſure: For the breath driven forth of the cheſt,and prohibited paſſage forth, ſwells and lifts up the ſubſtance of the brain,and the *Meninges*, whereupon that frothy humidity and *Sanies* ſweats forth. Therefore then the bone muſt be cut even to the *Dura Mater*,with *Radula* and other ſcraping Inſtruments,fit for that purpoſe, yet ſo as you hurt not the membrane; but if the fiſſure ſhall be ſomewhat long, it will not be convenient to follow it all the extent thereof: for nature will repair and reſtore the remnant of the fiſſure by generating a *Callus*; beſides alſo the Chirurgeon according to *Celſus* opinion muſt take away as little of the bone as he can, becauſe there is nothing ſo fit to cover the brain, as the skull. Therefore it ſhall ſuffice to make a paſſage, whereby the blood and *Sanies* may paſs and be drawn forth, leſt that matter being ſuppreſſed may corrupt the bone, and cauſe an inflammation in the brain. But the broken bone muſt be taken forth within three dayes if it be poſſible, eſpecially in Summer, for fear of inflammation. Yet I have often taken forth with a Trepan and with Scrapers the bones of the skull, after the ſeventeenth day, both in Winter and Summer; and that with happy ſucceſs. Which I have the rather noted, leſt any ſhould at any time, ſuffer the wounded to be left deſtitute of remedy: for it is better to try a doubtfull remedy than none: Yet the By-ſtanders ſhall be admoniſhed and told of the danger, for many more dye who have not the broken bones of the skull taken out, than thoſe that have.

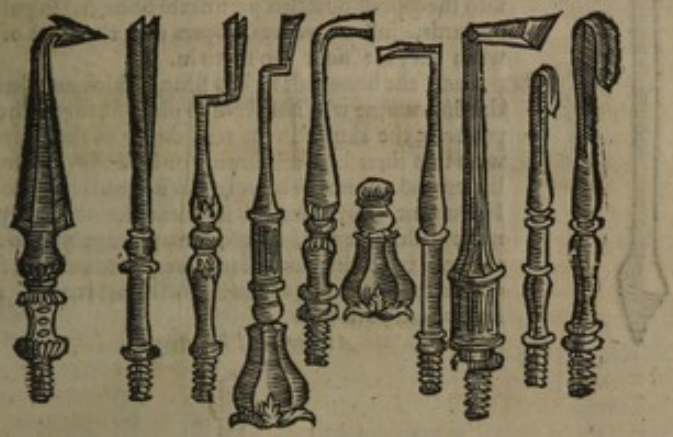
A ſign that both the Tables are broken.

You may uſe the Trepan after the tenth day.

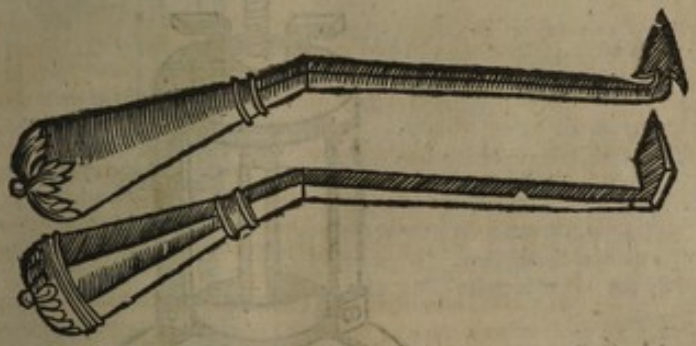
But

But the Instruments, with which the wounded or cleft bones may be cut out are called *Scalpri* or *Radulæ*, of which I have caused divers sorts to be here decyphered, that every one might take his choice, according to his mind, and as shall be best for his purpose. But all of them may be screwed into one handle, the figure whereof I have exhibited.

Radulæ or Scalpri, (1) *Shavers or Scrapers.*



Radulæ *of another form, for the better cutting of the greater bones.*



To conclude, when the skull shall be wounded or broken with a simple fissure, the Chirurgeon must think he hath done sufficient to the Patient, and in his Art, if he shall divide the bone and dilate the fissure or cleft with the described Instruments, though he have used no Trepan, although the fissure pierce through both the Tables. But if it doth not exceed the first Table, you must stay your scrapers as soon as you come to the second, according to the opinion of *Paulus*: but if the bone shal be broken & shivered into many peeces, they shall be taken forth with fit Instruments, using also a Trepan if need shall require, after the same manner as we shall shew you hereafter.

It is sufficient in a simple fissure to dilate it with your Scalpri only and not to Trepan it.

CHAP. V.

Of a Contusion, which is the second sort of fracture.

What an Ecchymosis is.

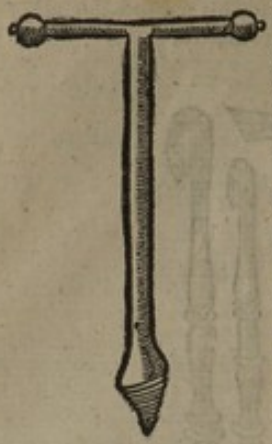
AN *Ecchymosis*, that is, effusion of blood, presently concreting under the musculous skin, without any wound, is oft caused by a violent contusion. This Contusion if it shall be great, so that the skin be divided from the skull, it is expedient, that you may make an incision, whereby the blood may be evacuated and emptied. For in this case you must wholly desist from suppurative medicines (which otherwise would be of good use in a fleshy part) by reason that all the moist things are hurtfull to the bones, as shall be shown hereafter.

How a contusion of the skul must be cured.

Such like Contusions more frequently happen in children, being easily perceived by the softness, and inundation of the contused part: forth of which oft-times when I have opened them with my incision knife, serous, clotted and blackish blood hath issued. The residue of the cure is perfected by moderate compression of the part, and drying medicines. Moreover the skul of a child, may be pressed down, by a great contusion, even as we see it happens in thin vessels of brass, lead, or pewter, for oft-times by the pressure of your finger, they are so dented in, that the print thereof remains; yet sometimes they fly back of themselves, and again acquire their former plainness and equability, which also happens in the bones of children, women and such as are soft, humid, & phlegmatick. But if the bones do not spring back of themselves, you must apply a cupping-glass with a great flame; withall command the Patient, to force his breath up as powerfully as he can, keeping his mouth and nose

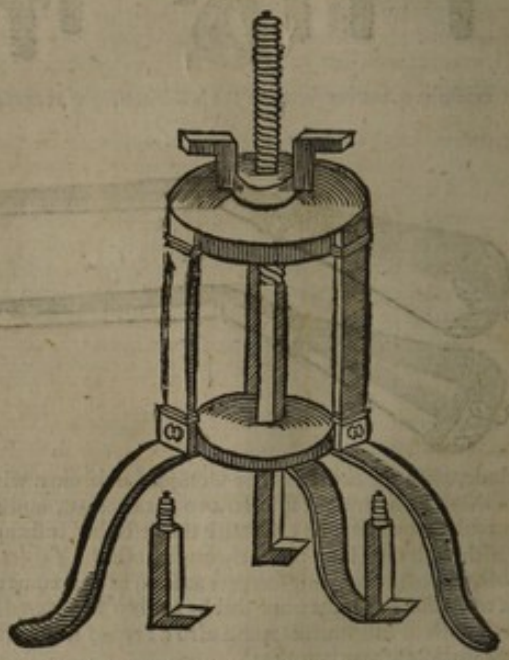
Different cures of a depressed skull.

close shut; for thus there will be hope, to restore the depressed bone to its place, by the spirits forc'd upwards to the brain and skull, by the powerfull attraction of the cupping-glass. But if so be that the bone cannot by this means be restored, then you must make an incision in the skin, and fasten such a Trepan, as you see here delineated, into the depress, or setled part of the bone, and so pull it directly upwards, just as we see Coopers raise the staves of their cask, when they are sunk too much in.



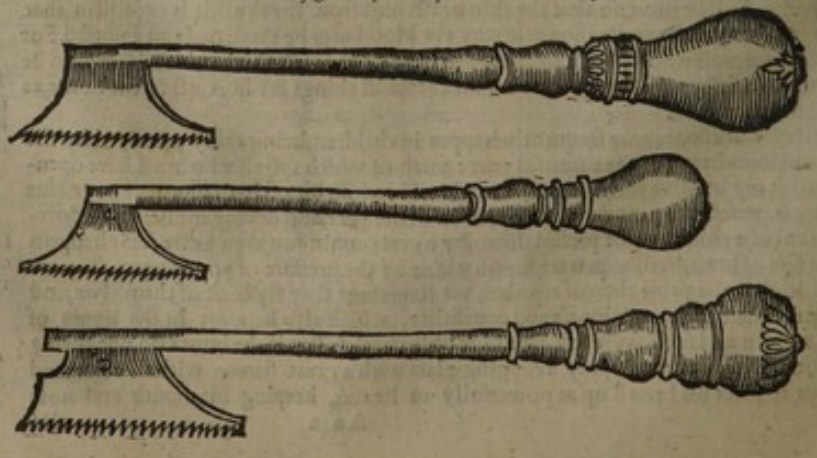
But if the bone shall be too strong, thick, and dense, so that this Instrument will not serve to pluck it forth; then you must perforate the skull, in the very center of the depression, and with this threefold Instrument, or Levatory put into the hole, lift up and restore the bone to its naturall site; for this same Instrument is of strength sufficient for that purpose. It is made with three feet, that so it may be applyed to any part of the head which is round; but divers heads may be fitted to the end thereof according as the business shall require, as the figure here placed doth shew.

A three footed Levatory.



But if at any time it comes to pass, that the bone is not totally broken or depress, but only on one side; it will be fit, so to lift it up, as also to make a vent for the issuing out of the filth, to divide the skul with little saws like these, which yee see here expressed; for thus so much of the bone, as shall be thought needfull, may be cut off without compression, neither will there be any danger of hurting the brain or membrane with the broken bone.

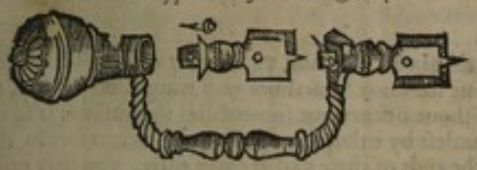
The figures of Saws fit to divide the skull.



But

But if by ſuch ſigns as are preſent, and ſhall appear, we perceive or judg that the contuſion goes but to the ſecond Table, or ſcarſe ſo far; the baring or taking away of the bone, muſt go no further than the contuſion reaches; for that will be ſufficient to eſchew and divert inflammations and divers other ſymptomes. And this ſhall be done with a ſcaling or Deſquamatory Trepan, (as they term it) with which you may eaſily take up as much of the bone, as you ſhall think expedient: And I have here given you the figure thereof.

A Deſquamatory or Scaling Trepan.



A delineation of other Levatories.

A A. *Shews the point or tongue of the Levatory, which muſt be ſomewhat dull, that ſo it may be the more gently and eaſily put betwe.n the* Dura Mater *and the ſkull, and this part thereof may be lifted up ſo much by the head or handle taken in your hand, as the neceſſity of the preſent operation ſhall require.*

B. *Intimates the body of the Levatory, which muſt be four ſquare, leſt the point or tongue put thereon ſhould not ſtand faſt, but the end of this Body muſt reſt upon the ſound bone, as on a ſure foundation.*

The uſe thereof is, thus; put the point or tongue under the broken or depreſſed bone, then lift the handle up with your hand, that ſo the depreſſed bone may be elevated.

C. *Shews the firſt Arm of the other Levatory, whoſe crooked end muſt be gently put under the depreſſed bone.*

D. *Shews the other Arm, which muſt reſt on the ſound bone, that by the firm ſtanding thereof, it may lift up the depreſſed bone.*

CHAP. VI.

Of an Effracture, depreſſion of the bone, being the third kind of Fracture.

BEfore I come to ſpeak of an Effracture, I think it not amiſs to crave pardon of the curteous and underſtanding Reader, for this reaſon eſpecially, that as in the former Chapter, when I had determined and appointed to ſpeak of a Contuſion, I inſerted many things of a Depreſſion; ſo alſo in this chapter of an Effracture, I intend to intermixe ſomething of a Contuſion; we do not this through any ignorance of the thing it ſelf; for wee know that it is called a Contuſion, when the bone is depreſt and cruſht, but falls not down. But an Effracture is when the bone falls down and is broken by a moſt violent blow. But it can ſcarſe come to paſs, but that the things themſelves muſt be confounded and mixt, both as they are done; and alſo when they are ſpoken of: ſo that you ſhall ſcarſe ſee a Contuſion without an Effracture, or this without that. Therefore the bones are often broken off and driven down with great and forcible blows, with clubs whether round or ſquare, or by falling from a high place directly down, more or leſſe according to the force of the blow, kind of weapon, and condition of the part receiving the ſame: Wherefore you muſt be provided with diverſity of remedies and inſtruments to encounter therewith. Wherefore admit the bone is preſſed down, and ſhivered into many pieces, now for that theſe ſplinters need not be taken out with a Trepan, you may do the buſineſs with Levatories made and neatly faſhioned for that purpoſe; ſuch as theſe, which are here expreſt.

What a contuſion is.

What an Effracture is.

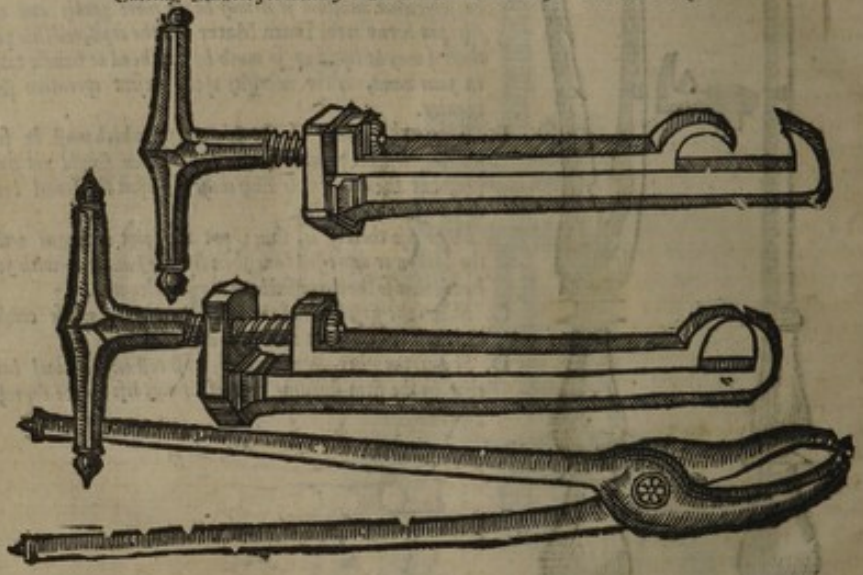
The cauſe of Effractures.

The cure.

A Levatorie.

But we muſt have ſpeciall care, leſt that in pulling and taking out of theſe ſcales and ſplinters, we hurt the membranes. Theſe ſcales are ſometimes very rough and prickly, ſo that they cannot touch the *Meninges* without offence; but ſomewhiles the buſineſs is ſo intricate, that they cannot be taken out unleſs by enlarging the fracture. Wherefore in this caſe, if there be a ſpace ſo large, as that the ends of theſe mullets may enter, you may eaſily ſhear off ſo much of the bone as ſhal be neceſſary and requiſite for the taking away of theſe ſcales, without any aſſiſtance of the Trepan, which I have done very often and with good ſucceſs; for the operation performed by theſe mullets is far more ſpeedy and ſafe, than that with the Trepan; and in the performance of every operation, the chief commendation is given to ſafeneſs and celerity.

Cutting Mullets, commonly called Roſtra Pſittaci, *or* Parrats beaks.



Moreover I have thought good here to give you the figures of chiſſels, ſcrapers, pincers, together with a leaden mallet, becauſe ſuch inſtruments are not only very neceſſary to take forth the ſcales of bones which are broken, but alſo to plain and ſmooth thoſe which remain whole.

The Figures of Scrapers, Pincers, a leaden mallet, &c.

But here you muſt note, that a Trepan, nor Levatorie, muſt never be applyed to a bone quite broken, leſt the membranes lying under it be hurt by the compreſſion thereof. Therefore you muſt apply them to a ſound bone, but as neer as you can to the fracture, ſo that you take away as little of the skull as is poſſible, leſt the brain deſpoiled of its bony cover, take ſome harm thereby. Neither effractures, nor yet fiſſures, if they be of ſome length, muſt be followed to their ends, but think your ſelf well, if you have made a paſſage for the iſſuing forth of the *Sanies* or filth, & have drawn forth that bone, which pricked the membranes. For nature is accuſtomed by generating a *Callus* to ſoulder, or unite the bones of the skul, as it alſo doth theſeof the other parts; as we have read it written by *Hippocrates* and *Galen*; for which purpoſe it hath by ſingular providence repleniſhed both the tables of the skull, with a certain alimentary and bloody matter, that with this as with marrow it might repair the loſs and defect of the bone. The

Hip. lib. de vulner. cap. Gal. lib 6. meth. cap. ult.

The truth hereof was lately manifested in the servant of Master *Grole*, who had an Effracture on the coronall bone, by a grievous blow, given him with the foot of a Mule; which when I understood, I divided the musculous skin with a three cornered section in that place, with an intent to apply a Trepan there; wherefore the day following, the bone being bored, and when I thought to draw it forth, yea verily endeavoured to pluck it forth, being already divided with the Trepan, I perceived a fearefull production of an Effracture; by the moveableness of the bone shaking under my hand; for it reached from the midst of the forehead, to the lesser corner of the eye. Wherefore omitting both my determination and endeavour to pull it forth, I thought I should do sufficiently for the patient, if I should only raise up the bone which was depresst; for so it did not trouble the *Crassa meninx* by pressing it, and the matter, and filth, were let forth by a passage made with a saw. So that in conclusion, he recovered perfectly, but that he lost one of his eyes which was adjoyning to the fracture. A History.

CHAP. VII.

Of a Seat, being the fourth kind of a broken Scull.

Hippocrates calls a Seat that kind of Fracture of the scull, when the weapon so falls upon the scull, that the fracture retaining the print thereof, is neither stretched forth any further, nor contracted to any lesse space. What a Seat is.

And seeing there be many forms hereof, they all whether they shall be superficiary, or shall pierce even to the *Diploe*, or else pass through both the Tables, whether it be with any loss of the bony substance, whether it run long wayes, or else be but short; or otherwise are dilated to some breadth, or else be but narrow; whether they shall be done with a cut, or with a prick with a dagger, styletto, lance or other kind of weapon, whether they shall have this or that accident joined with them, I say all of them, how many and various soever they be, ought and must be cured by some of the formerly described Instruments and means. Yet this must be noted, which as yet we have not remembred, that if it happen by a violent stroak, & great wound, that a portion of the bone is wholly so cut off, that it is clean severed from the rest of the scull, and hang only by the *Pericranium* and musculous skin; yet you must not pluck it from the *Pericranium*, and cast it away as unprofitable, but restore it to its proper seat and place, so by the force of nature, to be glewed by a *Callus*, as *Celsus* hath observed. The cure. *Lib.8. cap.4.*

I have tryed the truth of this experiment, in captain *Hydron*, not very long agoe. He had the middle part of the *Os Coronale*, of the bredth, and length of three fingers, so cut with a sharp sword, that it stuck not to the rest of the bone; but scarse adhering to the *Pericranium* and musculous skin; but lay turned down over his face, so that the *Dura Mater* was plainly seen; wherefore I prepared to pluck it from the skin, and cast it away, but that I remembred *Hippocrates* precept, where he bids, that the Brain should not be robbed of its cover and left bare. Wherefore first of all I wiped away the blood which was fallen upon the *Dura Mater*, whose motion you might plainly see, then I restored the portion of the bone to its place, and fastned it on the upper side with a suture consisting of three stitches; and that the residue of the matter might have passage forth, I filled the places between each stitch with lint, by this means, he by the mercie of God recovered, though at the same time he received many other large wounds in his body; which is a certain experiment, that we must cast away no part of the scull, nor of the *Pericranium*, no not of the musculous skin, unless necessity urge; therefore much less to leave the brain naked and despoiled of its coverings. A History.

CHAP. VIII.

Of a Resonitus, *or Counter-fissure, being the fifth kind of Fracture.*

Sometimes the fracture is made in the part opposite to that which received the blow; as if the right side be struck, the left is cloven; this kind of fracture is very dangerous, because we cannot find it out by any certain sign, as it is written by *Hippocrates Lib. de vuln. Capitis*. Wherefore if at any time the patient dye of such a fracture, the Chirurgeon must be pardoned. What a *Resonitus* is.

And although *Paulus Ægineta* laugh at this kind of fracture and thinks that it cannot happen to a mans head, as that which is hard and full, as it happens in empty glass bottles, yet I have sometimes seen and observed it. *Lib.6. cap 90.*

Neither is their reason of any validity, who think nature therefore to have framed the head of many bones knit together by sutures, lest the fracture of the one side, should be stretched to the other. For peradventure this may take place, in such as have expres sutures, seated and framed according to nature. But it takes no place in such as either want them, or have them not seated according to nature, or have them very close and so defaced that it may seem one bone growne together of many; This shall be made manifest by recitall of the following Historie. In whom this fracture may take place in divers bones of the scull.

A servant of *Massus* the Post-master had a grievous blow with a stone, upon the right *Bregma*, A History.

Bregma, which made but a ſmall wound, yet a great contuſion and Tumor. Wherefore that it might more plainly appear, whether the bone had received any harme, and alſo that the congealed blood might be preſſed forth, the wound was dilated, the skin being opened by *Theodore Hereus* the Chirurgeon, who as he was a skilfull workman and an honeſt man, omitted nothing which Art might do for his cure. When he had divided the skin, the bone was found whole, although it was much to be feared, that it was broken, becauſe he fell preſently to the ground with the blow, vomited and ſhewed other ſignes of a fractured ſcull; ſo it happened that he dyed on the one and twentieth day of his ſicknes. But I being called to learn, and ſearch how he came by his death, dividing the ſcul with a ſaw, found in the part oppoſite to the blow, a great quantity of *Sanies* or bloody matter, and an Abſceſs in the *Craſſa meninx*, and alſo in the ſubſtance of the very brain, but no ſutures, but the two ſcaly ones. Therefore that is certain which is now confirmed by the authority of *Hippocrates*; as alſo by reaſon and experience, that a blow may be received on the one ſide, and the bone may be fractured on the oppoſite, eſpecially in ſuch as have either no ſutures, or elſe ſo firmly united and cloſed, that they are ſcarſe apparent.

The *Reſonitus* may be in the ſame bone of the ſcull.

Neither is it abſurd, that the part, oppoſite to that which received the ſtroak, of the ſame bone and not of divers bones may be cloven, and in thoſe men who have their ſculs well made, and naturally diſtinguiſhed and compoſed with ſutures; and this both was, and is, the true meaning of *Hippocrates*. That this may be the better underſtood, we muſt note that the oppoſite part of the ſame bone may be underſtood two manner of wayes. Firſt, when the fracture is in the ſame ſurface of the ſmitten bone, as if that part of one of the bones of the *Bregma* which is next to the Lambdall ſuture be ſmitten, and the other part next to the Coronall ſuture be cloven. Secondly, when as not the ſame ſuperficies and table which receives the blow, but that which lyes under it is cleft, which kind of fracture I obſerved,

A Hiſtory.

in a certain Gentleman a Horſman of Captain *Stempans* troop; He in defending the breach of the wall of the Caſtle of *Hiſdin* was ſtruck with a Musket bullet upon the *Bregma*, but had his helmet on his head; the bullet dented in the helmet but did not break it, no nor the muſculous skin, nor ſcull, for as much as could be diſcerned, yet notwithſtanding he died apoplectick upon the ſixt day after.

But I being very deſirous to know, what might be the true cauſe of his death, dividing his ſcull; obſerved that the ſecond table was broken, and caſt off ſcales and ſplinters, wherewith as with needles the ſubſtance of the brain was continually pricked, the firſt and upper table being whole, for all this: I afterwards ſhewed the like example to *Capellanus* and *Caſtellanus* the King and Queens chief Phyſitians in the expedition of *Roane*.

Why *Hippocrates* ſet downe no way to cure a *Reſonitus*.

But *Hippocrates* preſcribes no method of curing this fifth kind of fracture, by reaſon he thinks it cannot be found out by any circumſtance, whence it happens that it is for the moſt part deadly: Yet muſt we endeavour to have ſome knowledg and conjecture of ſuch a fracture, if it ſhall at any time happen. Wherefore having firſt diligently ſhaven away the haire, we muſt apply an Emplaiſter of Pitch, Tar, Wax, Turpentine, the powder of *Iris*, or flower deluce roots, and maſtich; now if any place of the head ſhall appeare more moiſt, ſoft and ſwoln, it is ſomewhat likely that the bone is cleft in that place, ſo that the Patient, though thinking of no ſuch thing, is now and then fored to put his hand to that part of the ſcull. Confirmed with theſe and other ſigns formerly mentioned, let him call a counſell of learned Phyſitians; and foretell the danger to the Patients friends which are there preſent, that there may no occaſion of calumnie remain, then let him boldly perforate the ſcull; for that is far better, than forſake the Patient ready to yeeld to the greatneſs of the hidden diſeaſe, and ſo conſequently to dye within a ſhort while after. There are foure ſorts, or conditions of fractures, by which the Chirurgeon may be ſo deceived, that when the ſcull is broken indeed, yet he may think there is no fracture. The firſt is when the bone is ſo depreſſed, that it preſently riſes up into its true place, and native equability. The ſecond is when the fiſſure is only capillary. The third is when the bone is ſhaken on the inſide, the utter ſurface nevertheleſs remaining whole, foraſmuch as can be diſcerned. The fourth is, when the bone is ſtricken on the one ſide and cleft on the other.

The manner to know when the ſcull is fractured by a *Reſonitus*.

CHAP. IX.

Of the moving, or Concuſſion, of the Brain.

Gal. lib. 2. de comp. medic. cap. 6. & Com. ad Aph. 58. ſect. 7.

BEſides the mentioned kinds of fractures by which the brain alſo ſuffers; there is another kind of affect beſides nature, which alſo aſſailes it by the violent incurſion of a cauſe, in like manner, externall; they call it the Commotion or ſhaking of the brain, whence Symptomes like thoſe of a broken ſcull enſue. Falling from aloft upon a ſolid and hard body, dull and heavy blows, as with ſtones, clubs, ſtaves, the report of a peece of Ordnance, or crack of Thunder, and alſo a blow with ones hand.

Lib. 5. Epidem.

Thus as *Hippocrates* tells, that beautifull damoſell the daughter of *Nerius*, when ſhe was twenty yeeres old, was ſmitten by a woman, a friend of hers, playing with her, with her flat hand upon the fore part of the head, and then ſhe was taken with a giddines, and lay without breathing, and when ſhe came home, ſhe fell preſently into a great Feaver, her head

aked,

aked, and her face grew red. The ſeventh day after there came forth ſome two or three Ounces of ſtinking and bloody matter about her right eare, and ſhe ſeemed ſomewhat betttr and to be at ſomewhat more eaſe. The feaver encreaſed again, and ſhe fell into a heavy ſleepineſs, and loſt her ſpeech, and the right ſide of her face was drawn up, and ſhe breathed with difficulty, ſhe had alſo a convulſion and trembling; both her tongue failed her, and her eyes grew dull, on the ninth day ſhe died. But you muſt note, that though the head be armed with a helmet, yet by the violence of a blow, the Veines, and Arteries may be broken, not only theſe which paſs through the ſutures, but alſo thoſe which are diſperſed between the two tables in the Diploe, both that they might bind the *Craſſa meninx* to the skull, that ſo the brain might move more freely, as alſo that they might carry the alimentary juyce to the brain wanting marrow, that is, blood to nouriſh it, as we have formerly ſhewed in our Anatomie.

The veſſels of the brain broken by the commotion thereof.

But from hence proceeds the efflux of blood running between the skull, and membranes, or elſe between the membranes and brain; the blood congealing there, cauſeth vehement pain, and the eyes become blind, vomiting is cauſed, the mouth of the ſtomach ſuffering together with the brain, by reaſon of the Nerves of the ſixt conjugation, which run from the brain thither, and from thence are ſpread over all the capacity of the ventricle; whence becoming a partaker of the offence it contracts it ſelf, and is preſently as it were overturned; whence firſt, theſe things that are contained therein are expelled, and then ſuch as may flow, or come thither from the neighbouring and common parts, as the Liver and Gall; from all which choler, by reaſon of its naturall levity and velocity, is firſt expelled and that in greateſt plenty; and this is the true reaſon of that vomiting, which is cauſed and uſually followes upon fractures of the skull and concuſſions of the brain.

Signes.

Cauſa.

The cauſe of vomiting when the head is wounded.

Within a ſhort while after inflammation ſeizes upon the membranes and brain it ſelf, which is cauſed by corrupt and putrid blood proceeding from the veſſels broken by the violence of the blow, and ſo ſpread over the ſubſtance of the brain. Such inflammation communicated to the heart, and whole body by the continuation of the parts, cauſes a feaver. But a feaver, by altering the brain cauſes Doting; to which if ſtupidity ſucceed, the Patient is in very ill caſe, according to that of *Hippocrates*; Stupidity, and doting, are ill in a wound, or blow upon the head. But if to theſe evills, a ſphacell, and corruption of the brain enſue, together with a great difficulty of breathing, by reaſon of the diſturbance of the Animall faculty, which from the brain imparts the power of moving to the muſcles of the Cheſt, the inſtruments of reſpiration, then death muſt neceſſarily follow.

Aph. 14. ſect. 4.

A great part of theſe accidents appeared in King *Henry* of happy memory, a little before he dyed. He having ſet in order the affaires of France, and entred into amitie with the neighbouring Princes, deſirous to honour the marriages of his daughter, and ſiſter, with the famous and noble exerciſe of Tilting, and he himſelf running in the Tilt-yard, with a blunt lance received ſo great a ſtroak upon his breſt, that with the violence of the blow, the viſour of his helmet flew up, and the trunchion of the broken Lance hit him above the left eye-brow, and the muſculous skin of the forehead was torn even to the leſſer corner of the left eye, many ſplinters of the ſame trunchion being ſtruck into the ſubſtance of the fore mentioned eye, the bones being not touched or broken; but the brain was ſo moved and ſhaken, that he dyed the eleaventh day after the hurt. His skull being opened after his death, there was a great deal of blood found between the *Dura*, and *Pia Mater*, poured forth in the part oppoſite to the blow, at the middle of the ſuture of the hind part of the head; & there appeared ſigns by the native colour turned yellow, that the ſubſtance of the brain was corrupted, as much as one might cover with ones thumb. Which things cauſed the death of the moſt Chriſtian King, and not only the wounding of the eye, as many have falſly thought. For we have ſeen many others, who have not dyed of farre more grievous wounds in the eye.

A Hiſtory.

What was the neceſſary cauſe of the death of King Henry the ſecond of France.

The hiſtory of the Lord Saint *Johns* is of late memory: he in the Tilt-yard, made for that time before the Duke of *Guiſes* houſe, was wounded with a ſplinter of a broken Lance, of a fingers length and thickneſſe, through the viſour of his Helmet, it entring into the Orbe under the eye, and piercing ſome three fingers bredth deep into the head; by my help and Gods favour he recovered, *Valeranus* and *Duretus* the Kings Phyſitians and *James* the Kings Chirurgeon aſſiſting me.

A Hiſtory.

What ſhall I ſay of that great and very memorable wound of *Francis* of *Loraine* the Duke of *Guiſe*? He in the fight of the City of *Bologne* had his head ſo thruſt through with a Lance, that the point entring under his right eye by his noſe, came out at his neck between his ear and the *Vertebræ*, the head or Iron being broken and left in by the violence of the ſtroak, which ſtuck there ſo firmly, that it could not be drawn or plucked forth, without a pair of ſmiths pincers. But although the ſtrength and violence of the blow was ſo great, that it could not be without a fracture of the bones, a tearing and breaking of the Nerves, Veines, Arteries and other parts; yet the generous Prince by the favour of God recovered.

A Hiſtory.

By which you may learn, that many dye of ſmall wounds; and other recover of great, yea, very large and deſperate ones. The cauſe of which events is chiefly and primarily to be attributed to God, the author and preſerver of mankind; but ſecondarily to the variety

Why ſome dye of ſmall wounds and others recover of great.

variety and condition of temperaments. And thus much of the commotion or concuſſion of the brain; whereby it happens that although all the bone remains perfectly whole, yet ſome veins broken within by the ſtroak, may caſt forth ſome blood upon the membranes of the brain, which being there concrete may cauſe great pain, by reaſon whereof it blinds the eys; if ſo be that the place can be found againſt which the pain is, and when the skin is opened, the bone look pale, it muſt preſently be cut out, as *Celſus* hath written. Now it remains, that we tell you how to make your prognoſticks, in all the forementioned fractures of the skul.

CHAP. X.

Of Prognoſticks to be made, in fractures of the skull.

Hip. de vul. cap.

WE muſt not neglect any wounds in the head, no not theſe which cut or bruiſe but only the hairly ſcalp; but certainly much leſs, theſe which are accompanied by a fracture in the skull; for oft-times all horrid ſymptomes follow upon them, and conſequently death it ſelf, eſpecially in bodies ful of ill humors, or of an ill habit, ſuch as are theſe which are affected with the *Lues venerea*, leproſie, dropſie, Pthiſick, conſumption, for in theſe, ſimple wounds are hardly or never cured; for union is the cure of wounds, but this is not performed, unleſs by the ſtrength of nature, and ſufficient ſtore of laudable blood: but thoſe which are ſick of hectick feavers and conſumptions, want ſtore of blood, and thoſe bodies which are repleat with ill humors, and of an ill habit, have no afflux or plenty of laudable blood: but all of them want the ſtrength of nature; the reaſon is almoſt the ſame in thoſe alſo which are lately recovered of ſome diſeaſe.

Whether the wounds of children, or old people are better to heal.

Thoſe wounds which are bruiſed are more difficult to cure, than thoſe which are cut. When the skull is broken, then the continuity of the fleſh lying over it muſt neceſſarily be hurt and broken, unleſs it be in a *Reſonitus*. The bones of children are more ſoft, thin, and repleniſhed with a ſanguine humidity, than thoſe of old men, and therefore more ſubject to putrefaction; Wherefore the wounds which happen to the bones of children, though of themſelves, and their own nature they may be more eaſily healed, (becauſe they are more ſoft, whereby it comes to paſs, that they may be more eaſily agglutinated, neither is there fit matter wanting for their agglutination by reaſon of the plenty of blood laudable both in conſiſtence and quality) than in old men, whoſe bones are dryer and harder, and ſo reſiſt union, which comes by mixture, and their blood is ſerous, and conſequently a more unfit bond of unity and agglutination; yet oft-times through occaſion of the ſymptomes which follow upon them, that is, putrefaction and corruption, which ſooner ariſe in a hot and moiſt body, and are more ſpeedily encreaſed in a ſoft and tender, they uſually are more ſuſpected and difficult to heal.

The Patient lives longer of a deadly fracture in the skull, in Winter than in Summer, for that the native heat is more vigorous in that time than in this; beſides, alſo the humors putrefie ſooner in Summer, becauſe unnaturall heat is then eaſily inflamed and more predominant, as many have obſerved out of *Hippocrates*.

Aph. 15. ſect. 1.

The wounds of the brain and of the *Meninges* or membranes thereof are moſt commonly deadly, becauſe the action of the muſcles of the cheſt, and others ſerving for reſpiration, is divers times diſturbed and intercepted, whence death inſues. If a ſwelling happening upon a wound of the head preſently vaniſh away, it is an ill ſign, unleſs there be ſome good reaſon therefore, as blood-letting, purging, or the uſe of reſolving locall medicines, as may be gathered by *Hippocrates* in his Aphoriſms. If a feaver inſue preſently after the beginning of a wound of the head, that is, upon the fourth or ſeventh day, which uſually happens, you muſt judg it to be occaſioned by the generating of *Pus* or Matter, as it is recited by *Hippocrates*. Neither is ſuch a feaver ſo much to be feared, as that which happens after the ſeventh day, in which time it ought to be terminated; but if it happen upon the tenth or fourteenth day with cold or ſhaking, it is dangerous, becauſe it makes us conjecture that there is putrefaction in the brain, the *Menings*, or skul, through which occaſion it may ariſe, chiefly if other ſigns ſhall alſo concur, which may ſhew any putrefaction, as if the wound ſhall be pallid and of a faint yellowiſh colour, as fleſh looks after it is waſhed.

Aphor. 65. ſect. 5.

Aph. 47. ſect 2.

Wounds which are dry, rough, livid and black are evill.

For, as it is in *Hippocrates Aphoriſ.* 2. *ſect.* 7. It is an ill ſign if the fleſh look livid, when the bone is affected; for that colour portends the extinction of the heat, through which occaſion, the lively, or indifferently red colour of the part, faints and dyes, and the fleſh thereabout is diſſolved into a viſcid *Pus* or filth.

Commonly another worſe affect follows hereon, wherein the wound becoming withered and dry, looks like ſalted fleſh, ſends forth no matter, is livid and black, whence you may conjecture, that the bone is corrupted, eſpecially if it become rough, whereas it was formerly ſmooth and plain; for it is made rough when *Caries* or corruption invades it; but as the *Caries* increaſes, it becomes livid and black, ſanious matter with all ſweating out of the *Diploe*, as I have obſerved in many: all which are ſigns that the native heat is decayed, and therefore death at hand; but if ſuch a feaver be occaſioned from an *Eryſipelas* which is either preſent or at hand, it is uſually leſs terrible. But you ſhall know by theſe ſigns, that the feaver is cauſed by an *Eryſipelas* and conflux of cholerick matter; if it keep the form of a Tertian

The ſigns of a feaver cauſed by an *Eryſipelas*.

tian,if the fit take them with coldneſs and end in a ſweat; if it be not terminated before the cholerick matter is either converted into *Pus* or elſe reſolved;if the lips of the wound be ſomewhat ſowln,as alſo all the face; if the eyes be red and fiery; if the neck and chaps be ſo ſtiffe,that he can ſcarſe bend the one,or open the other;if there be great exceſs of biting and pricking pain,and heat, and that far greater than in a *Phlegmon*. For ſuch an *Eryſipelous* diſpoſition generated of thin and hot blood,chiefly aſſails the face,and that for two cauſes.

The firſt is,by reaſon of the naturall levity of the cholerick humor;the other becauſe of the rarity of the skin of theſe parts.

Why an *Eryſipelas* chiefly aſſails the face.

The cure of ſuch an affect muſt be performed by two means,that is,evacuation,and cooling with humectation. If choler alone, cauſe this tumor,we muſt eaſily be induced to let blood,but we muſt purge him with medicines evacuating choler. If it be an *Eryſipelas phlegmonodes*,you muſt draw blood from the Cephalick vein of that ſide, which is moſt affected, alwayes uſing adviſe of a Phyſitian.Having uſed theſe generall means,you muſt apply refrigerating and humecting things, ſuch as are the juyce of Night-ſhade, Houſleek, Purſlane, Lettuce, Navell wort, Water Lentill, or Ducks-meat, Gourds; a liniment made of two handfuls of Sorrell boyled in fair water,then beaten or drawn through a ſearſe,with oyntment of Roſes,or ſome *unguent. Populeon* added thereto,will be very commodious. Such and the like remedies muſt be often and ſo long renewed untill the unnaturall heat be extinguiſhed.But we muſt be carefull to abſtain from all unctuous and oyly things, becauſe they may eaſily be inflamed,and ſo increaſe the diſeaſe. Next we muſt come to reſolving medicines;but it is good when any thing comes from within, to without; but on the contrary it is ill,when it returns from without inwards, as experience and the Authority of *Hippocrates* teſtifie:If when the bone ſhall become purulent,puſtules ſhall break out on the tongue; by the dropping down of the acrid filth or matter by the holes of the palat upon the tongue,which lyes under. Now when this ſymptom appears, few eſcape. Alſo it is deadly when one becomes dumb and ſtupid, that is,Apoplectick by a ſtroak or wound on the head; for it is a ſign that not only the bone,but alſo the brain it ſelf is hurt. But oft-times the hurt of the Brain proceeds ſo far,that from corruption it turns to a Sphacell, In which caſe,they all have not only puſtules on their tongues,but ſome of them dye ſtupid and mute, otherſome with a convulſion of the oppoſite part;neither as yet have I obſerved any which have dyed with either of theſe ſymptomes,by reaſon of a wound in the head,who have not had the ſubſtance of their brain tainted with a Sphacell, as it hath appeared when their skulls have been opened after their death.

Why oyly things muſt nor be uſed in an *Eryſipelas* of the face, *Aph.* 25.*ſect.* 6.

Deadly ſigns in wounds of the head.

CHAP. XI.

Why,when the brain is hurt by a wound of the head,there may follow a Convulſion of the oppoſite part.

MAny have to this day enquired, but as yet as far as I know it hath not been ſufficiently explained,why a convulſion in wounds of the head ſeizes on the part oppoſite to the blow. Therefore I have thought good to end that controverſie in this place. My reaſon is this, that kind of Symptom happens in the ſound part by reaſon of emptineſs and dryneſs; but there is a twofold cauſe,and that wholly in the wounded part,of this emptineſs and dryneſs of the ſound or oppoſite part;to wit, pain and the concourſe of the ſpirits and humors thither by the occaſion of the wound,and by reaſon of the pains drawing and natures violently ſending help to the afflicted part.

A convulſion is cauſed by dryneſs.

A twofold cauſe of convulſifick dryneſs.

The ſound part exhauſted by this means both of the ſpirits and humors,eaſily falls into a Convulſion.

For thus *Galen* writes; God the Creator of nature,hath ſo knit together,the triple ſpirituous ſubſtance of our bodies, with that tye, and league of concord,by the productions of the paſſages;to wit of Nerves,Veins,and Arteries,that if one of theſe forſake any part, the reſt preſently neglect it,whereby it languiſheth; and by little and little dyes, through defect of nouriſhment. But if any object that nature hath made the body double,for this purpoſe,that when one part is hurt,the other remaining ſafe and ſound,might ſuffice for life and neceſſity: but I ſay,this axiom hath no truth in the veſſels and paſſages of the body. For it hath not every where doubled the veſſels,for there is but one only vein, appointed for the nouriſhment of the brain,and the membranes thereof, which is that they call the *Torcular*,by which when the left part is wounded, it may exhauſt the nouriſhment of the right and ſound part,and though that occaſion cauſe it to have a convulſion,by too much dryneſs;Verily it is true,that when in the oppoſite parts,the muſcles of one kind are equall in magnitude,ſtrength,and number,the reſolution of one part,makes the convulſion of the other by accident;but it is not ſo in the brain.

Lib.4.de uſu partium.

For the two parts of the brain,the right and left, each by its ſelf performs that which belongs thereto,without the conſent, conſpiration or commerce of the oppoſite part; for otherwiſe it ſhould follow, that the Palſie properly ſo called, that is of half the body, which happens by reſolution,cauſed either by mollification or obſtruction reſiding in either part of the brain,ſhould infer together with it a Convulſion of the oppoſite part. Which notwithſtanding dayly experience convinces as falſe. Wherefore we muſt certainly

think,

think, that in wounds of the head wherein the brain is hurt, that inanition and want of nouriſhment are the cauſes, that the ſound and oppoſite part ſuffers a convulſion.

Opinion of *Dalechampius*

Francis Dalechampius in his French Chirurgery renders another reaſon of this queſtion; That, (ſaith he) the truth of this propoſition may ſtand firm and ratified, we muſt ſuppoſe, that the convulſion of the oppoſite part mentioned by *Hippocrates*, doth then only happen, when by reaſon of the greatneſs of the inflammation in the hurt part of the brain, which hath already inferred corruption, and a Gangrene to the brain and membranes thereof, and within a ſhort time is ready to cauſe a ſphacell in the ſkull, ſo that the diſeaſe muſt be terminated by death; for in this defined ſtate of the diſeaſe, and theſe conditions, the ſenſe and motion muſt neceſſarily periſh in the affected part, as we ſee it happens in other Gangrens, through the extinction of the native heat. Beſides, the paſſages of the animall ſpirit muſt neceſſarily be ſo obſtructed by the greatneſs of ſuch an inflammation or phleginon, that it cannot flow from thence to the parts of the ſame ſide lying there under, and to the neighbouring parts of the brain; and if it ſhould flow thither, it will be unprofitable to carry the ſtrength and faculty of ſenſe and motion, as that which is infected and changed by admixture of putrid and Gangrenous vapours. Whereby it cometh to paſs, that the wounded part deſtitute of ſenſe, is not ſtirred up to expell that which would be troubleſome to it, if it had ſenſe; wherefore neither are the Nerves thence ariſing ſeiſed upon, or contracted by a Convulſion.

It furthermore comes to paſs, that becauſe theſe ſame nerves are deprived of the preſence and comfort of the animall ſpirit, and in like manner the parts of the ſame ſide, drawing from thence their ſenſe and motion are poſſeſſed with a palſie; for a palſie is cauſed either by the cutting or obſtruction of a Nerve, or the madefaction, or mollification thereof by a thin and watry humor, or ſo affected by ſome vehement diſtemper, that it cannot receive the Animall ſpirit.

But for the oppoſite part and the convulſion thereof, it is known and granted by all, that a convulſion is cauſed either by repletion which ſhortens the Nerves by diſtending them into bredth, or by inanition, when as the native and primitive heat of the Nerves being waſted, their proper ſubſtance becoming dry is wrinckled up and contracted; or elſe it proceeds from the vellication, and acrimonie of ſome vapour, or ſanious and biting humor, or from vehemency of pain. So we have known the falling ſickneſs cauſed by a venenate exhalation carried from the foot to the brain. Alſo we know that a convulſion, is cauſed in the puncture of the Nerves, when as any acrid and ſanious humor is ſhut up therein, the orifice thereof being cloſed; but in wounds of the Nerves when any Nerve is half cut, there happens a convulſion by the bitterneſs of the pain.

But verily in the oppoſite part, there are manifeſtly two of theſe cauſes of a convulſion; that is to ſay, a putrid and carionlike vapour, exhaling from the hurt, and Gangrenate part of the brain; and alſo a virulent, acrid and biting *Sanies*, or filth, ſweating into the oppoſite ſound part, from the affected and Gangrenous; the malignity of which *Sanies*, *Hippocrates* deſirous to decipher, in reckoning up the deadly ſigns of a wounded head, hath expreſſed it by the word *Ichor*; and in his book of fractures he hath called this humor *Dacryodes et non Pyon.* [that is, *weeping and not digeſted.*] Therefore it is no marvail if the oppoſite and ſound part endued with exquiſite and perfect ſenſe, and offended by the flowing thereto of both the vaporous and ſanious matter, uſing its owne force, contend and labour as much as it can, for the expulſion of that which is troubleſome thereto. This labouring or conculſion is followed (as we ſee in the falling ſickneſs) by a convulſion, as that which is undertaken in vain, death being now at hand; and nature over-ruled by the diſeaſe. Thus (ſaith *Dalechampius*) muſt we in my judgement determine of that propoſition of *Hippocrates* and *Avicen.*

But he addes further, in wounds of the head, which are not deadly, practitioners obſerve that ſometimes the hurt part is taken with the palſie, and the ſound with a convulſion; otherwhiles on the contrary, the wounded part is ſeiſed by a Convulſion and the ſound by a Palſie; otherwhiles both of them by a convulſion or Palſie, and ſomewhiles the one of them by a convulſion or Palſie, the other being free from both affects; the cauſes of all which belong not to this place to explain. Thus much *Dalechampius.*

CHAP. XII.

A Concluſion of the deadly ſigns in the Wounds of the head.

The ſignes of a deadly wound from the depraved faculties of the minde.

NOw that we may returne to our former diſcourſe; you may certainly foretell the patient will dye; when his reaſon and judgement being perverted, he ſhall talke idly; when his memory fails him; when he cannot governe his tongue; when his ſight growes dark and dim, his ears deaf, when he would caſt himſelf headlong from his bed, or elſe lyes therein without any motion; when he hath a continuall feaver with a *delirium*; when the tongue breaks out in puſtles, when it is chopt, and become black, by reaſon of too much dryneſs; when the wound grows dry, and caſts forth little or no matter; when as the colour of the wound which was formerly freſh, it now become like

From habite of the body,

ſalted

falted flesh yellow and pale; when the Urine, and other excrements suppresst; when the palsie, convulsion, apoplexie; and lastly, often sowning, with a small and unequall pulse, invade him. All such signs sometimes appear presently after the wound, otherwhiles some few dayes after; therefore when as the brain is hurt and wounded by the violence of the incision, or fissure, of the contusion, compression, puncture, concussion, or any other fracture, the forementioned signs appear presently in the first dayes; but when they do not appear til many dayes after the blow, you may know that they rise and appear, by reason of an inflammation and phlegmon in the brain, occasioned by the putrefaction of the bloud poured forth upon it.

From the time that such signs appear.

But we must observe this by the way, which also belongs to the prognosticks, that flesh is easily regenerated, and restored in all parts of the head, except in that part of the forehead, which is a little above that which lies between the eye-brows, so that it will be ulcerated ever after, and must be covered with a Plaister. I beleeve that in that place there is an internall cavity in the bone, full of air, which goes to the five-like bones of the nose, by which the growth of flesh may be hindered; or else that the bone is very dense or compact in that place, so that there can scarse sufficient juice sweat forth, which may suffice for the regeneration of flesh; add hereunto a great conflux of excrements flowing to this ulcer, which should otherwise be evacuated by the eyes and nose, which hinder by that means the dryness of the ulcer, and consequently the healing thereof.

Celsus lib. 8. cap. 4.

Hence certainly it comes to pass, that if you desire the Patient thus affected to breath, shutting his mouth and nose, the air or breath will come forth of the ulcer with such force, as it will easily blow forth a lighted candle of an indifferent bigness held thereto. Which thing I protest, I observed in a certain man, whom I was forced to trepan in that place, by reason the bone of the forehead was broken and depressed.

CHAP. XIII.

Of salutary signs in wounds of the head.

BUt on the contrary these are salutary signs, when the Patient hath no feaver, is in his right mind, is well at the application or taking of any thing, sleeps well, hath his belly soluble, the wound looks with a fresh and lively colour, casts forth digested and laudable matter, the *Crassa Meninx* hath its motion free and no way hindred.

When the Patients are out of danger.

Yet we must note, which also is observed by the Ancients and confirmed by experience, that we must think none past danger, and free from all chance, untill the hundreth day be past. Wherefore the Physitian ought so long to have a care of his Patient, that is, to consider how he behaves and governs himself in meat, drink, sleep, venery and other things.

The Patient must beware of cold.

But let the Patient diligently avoid and shun cold, for many when they have been cured of wounds of the head, by careless taking cold have been brought into danger of their lives. Also you must know that the *Callus* whereby the bones of the skull are knit together, requires almost the space of forty or fifty dayes to its perfect coagmentation and concretion. Though in very deed one cannot set down a certain number of dayes, by reason of the variety of bodies, or tempers: For it is sooner finished in young men, and more slowly in old; And thus much may serve for prognosticks. Now will we treat as briefly and perspicuously as we can of the cure both in generall and particular; wherefore beginning with the generall we will first prescribe a convenient diet by the moderate use of the six things not naturall.

CHAP. XIIII.

Of the generall cure of a broken skull, and of the Symptomes usually happening thereupon.

How the air ought to be.

THe first cure must be, to keep the Patient in a temperate air; and if so be, that it be not such of it self and its own proper nature, it must be corrected by Art. As in winter he must have a clear fire made in his chamber, lest the smoak cause sneesing and other accidents; and the windows and doors must be kept shut to hinder the approach of the cold air and wind. All the time the wound is kept open to be dresst, some body standing by shall hold a chasendish ful of coals or a heated Iron bar over the wound, at such a distance, that a moderate heat may pass thence to the wound; and the frigidity of the encompassing air may be corrected by the breathing of the diffused heat. For cold according to the opinion of *Hippocrates*, is an enemy to the Brain, Bones, Nerves, and spinall marrow; it is also hurtfull to ulcers, by suppressing their excrements, which suppresst do not only hinder suppuration, but also by corrosion makes them sinuous. Therefore *Galen* rightly admonisheth us, to keep cold from the brain, not only in the time of trepaning, but also afterwards. For there can be no greater, nor more certain harm befall the fractured skul, than by admitting the air, by such as are unskilfull. For if the air should be hotter than the brain, then it could not thence be refrigerated; but if the brain should be laid open to the air, in the midst of summer, when it is at the hottest, yet would it be refrigerated; and unless it were relieved with hot things, take harm: this is the opinion of *Galen*, whereby you may understand that many who have their skulls broken, dye more through default of skill in the curing, than by the greatness of the fracture.

Aphor. 18. sect. 5.

Lib. 2. de usu part. cap. 2.

The Air though in summer is colder than the brain.

But (when the wound is bound up with the pledgets, cloths, and rowlers, as is fit) if the air chance to be more hot, than the Patient can well indure, let it be amended by sprinkling, and strawing the chamber with cold water, oxycrate, the branches of Willows and Vine. Neither is it sufficient to shun the too cold air, unless also you take heed of the over light, chiefly untill such time as the most feared and malign symptomes are past.

The discommodities of too much light.

For a too great light dissipates the spirits, increases pain, strengthens the feaver and symptomes. *Hippocrates* wholly forbids wine, therefore the Patient instead thereof must drink Barly water, fair water boyled and tempered with Julep of Roses, syrup of Violets, vinegar and the like: water wherein

What his drink must be.

in bread crums have been steeped,water and sugar with a little juyce of Lemons,or pomecitron added thereto,and such like as the ability and taste of the Patient shall require. Let him continue such drinks untill he be free from malign symptoms,which usually happen within fourteen dayes.

Almonds increase the pain of the head.

His meat shall be pap, ptisan,shunning Almond milks;(for Almonds are said to fil the head with vapours and cause pain)stued damask Prunes,Raisons and currants,seasoned with sugar, and a little cinnamon(which hath a wonderfull power to comfort the stomach, and revive and exhilarate the spirits) Chickens,Pidgeons,Veal,Kid,Leverets,birds of the fields,Pheasons,black-birds,Turtles,Partridges,Thrushes,Larks and such like meats of good digestion, boiled with lettuce,purslain,sorrell, borage,bugloss,succory,endive and the like,are thought very convenient in this case.If he desire at any time to feed on these meats rosted, he may only dipping them in verjuice, in the acid juices of Oranges,Citrons,Lemons, or Pomegranats, sometimes in one, and sometimes in another, according to his tast and ability.If any have a desire to eat fish, he must mak choyce of Trouts,Gudgeons,Pikes and the like,which live in running and clear waters,and not in muddy;he shall eschew all cold sallets and pulse,because they fly up and trouble the head:it will be convenient after meat to use common dridg powder,or Anised,Fennellseed or Coriander comfits, also conserve of Roses,or Marmilate of Quinces to shut up the orifice of the Ventricle, lest the head should be offended with vapours arising from thence.

What fish he may eat.

Aphor. 13. & 14. sect. 1.

Children must eat often,but sparingly;for children cannot fast so long as those which are elder, because their naturall heat is more strong,wherefore they stand in need of more nourishment;so also in winter all sorts of people require more plentifull nourishment, for that then their stomachs are more hot than in Summer.

Aphor. 15. sect. 2.

When the foureteenth day is past,if neither a feaver, nor any thing else forbid,he may drink wine moderately,& by little and little,encrease his diet,but that respectively to each ones nature,strength and custome.He shall shun,as much as in him lyes,sleep on the day time,unless it happen that a *Phlegmon* seise upon the brain or *Meninges*.For in this case it will be expedient to sleep on the day time, especially from morning till noon,for in this season of the day, as also in the spring blood is predominant in the body, according to the opinion of *Hippocrates*. For it is so vulgarly known, that it need not be spoken,that the blood when we are awake is carried into the habit and surface of the body; but on the contrary by sleep it is called into the noble parts,the Heart and Liver.Wherefore if that the blood by the force of the Sun casting his beams upon the earth at his rising is carryed into the habit of the body, should again be more and more diffused by the strength & motion of watching,the inflammation in the brain and *Meninges* would be much encreased.Wherefore it will be better, especially then to stay by sleep the violence of the blood running into the habit of the body, when it shall seem to rage and more violently to affect that way. Watching must in like manner be moderate;for too much depraves the temper of the brain and of the habit of the whole body;it causes crudities,pains and heavines of the head,and makes the wounds dry and maligne.

Why sleep upon the day time is good for the brain being inflamed.

Lib. 2. Epidem.

The discommodities insuing immoderate Watching.

Gal. Meth. 18.

But if the Patient cannot sleep by reason of the vehemency of the inflammation of the brain and *Meninges*, *Galen* wishes,to wash, besmear and anoint the head, nose, temples and ears with refrigerating and humecting things,for these stupefie,and make drowsie the Brain and membranes thereof,being more hot than they ought to be. Wherefore for this purpose let the temples be anointed with *Vnguentum populeon*,or *Vnguentum Rosatum* with a little rose vinegar, or oxycrate;let a spunge moistened in the decoction of white or black poppie seed,of the rinds of the roots of Mandrages,of the seeds of Henbane,lettuce,purslane,plantain, night-shade and the like. He may also have a broath or barly cream, into which you may put an emulsion made of the seeds of white Poppy, or let him have a potion made with ℥ i,or ℥ i ß,of the syrup of poppy,with ℥ ij,of Lettuce water;Let the Patient use these things 4.houres after meat,to procure sleep. For sleep doth much help concoction, it repairs the efflux of the triple substance caused by watching asswageth pain, refresheth the weary, mitigates anger and sorrow, restores the depraved reason, so that for these respects it is absolutely necessary that the Patient take his naturall rest.

Medicines procuring sleep.

The commodities of sleep.

If the Patient shall be plethorick, let the plenitude be lessened by blood-letting, purging and a slender diet, according to the distertion of the Physitian who shall oversee the cure. But we must take heed of strong purgations,in these kinds of wounds,especially at the beginning, lest the feaver, inflammation,pain,and other such like symptoms be increased by stirring up the humors.

Lib. 4. meth.

Phlebotomy,according to *Galens* opinion, must not only be made respectively to the plenty of blood,but also agreeable to the greatnes of the present disease, or that which is to come,to divert, and draw back that humor which flows down, by a way contrary to that which is impact in the part; and which must be there evacuated,or drawn to the next. Wherefore for example,if the right side of the head be wounded,the Cephalick vein of the right arm shall be opened,unless a great *Plethora* or plenitude cause us to open the *Basilica*,or Median,yet if neither of them can be fitly opened, the *Basilica* may be opened,although the body is not plethorick. The like course must be observed in wounds of the left side of the head;for that is far better by reason of the straitnes of the fibers, than to draw blood on the opposite side;in performance whereof you must have diligent care of the strength of the Patient,still feeling his pulse, unless a Physitian be present,to whose judgment you must then commit all that busines. For the pulse is, in *Galens* opinion, the certainest shewer of the strength. Wherefore we must consider the changes and inequalities thereof,for as soon as we find it to become lesser and more slow,when the forehead begins to sweat a little, when he feels a pain at his heart,when he is taken with a desire to vomit,or go to stool,or with yawning,and when he shall change his colour and his lips look pale,then you must stop the blood as speedily as you can;otherwise there will be danger lest he poure forth his life together with his blood. Then he must be refreshed with bread steeped in wine,and put into his mouth,and by rubbing his temples and nostrils

Lib. de cur. per sanguinis miss.

with

with ſtrong vinegar, and by lying upon his back. But the part ſhall be eaſed and freed from ſome portion of the impact and conjunct humor by gently ſcarifying the lips of the wound, or applying of Leeches. But it ſhall be diverted, by opening theſe veins which are higheſt to the wounded part, as the *Vena puppis*, or that in the midſt of the forehead, or of the temples, or theſe which are under the tongue; beſides alſo cupping-glaſſes ſhall alſo be applyed to the ſhoulder ſometimes, with ſcarification, ſometimes without; neither muſt ſtrong and long frictions, with courſe clothes, of all the whole body, the head excepted, be omitted during the whole time of the cure, for theſe will be available, though but for this; that is, to draw back and diſſipate by inſenſible tranſpiration the vapours which otherwiſe would aſcend into the head, which matters certainly in a body that lyes ſtill and wants both the uſe and benefit of accuſtomed exerciſe, are much increaſed. The uſe of Fractures.

But it ſhall be made manifeſt by this following and notable example, how powerfull blood-letting is, to leſſen and mitigate the inflammation of the Brain, or the membranes thereof in wounds of the head. I was lately called into the ſuburbs of Saint *German*, there to viſit a young man twenty eight yeeres old, who lodged there in the houſe of *John Martiall*, at the ſign of Saint *Michaell*. This young man, was one of the houſhold ſervants of Maſter *Doucador*, the ſteward of the Lady *Admirall* of *Brion*. He fell down headlong upon the left *Bregma*, upon a marble pavement, whence he received a contuſed wound, without any fracture of the skull, and being he was of a ſanguin temperature, by occaſion of this wound, a feaver tooke him on the ſeaventh day with a continuall *delirium* and inflamation of phlegmonous tumor of the wounded *Pericranium*. This ſame tumor poſſeſſing his whole head and neck by continuation and ſympathy of the parts, was grown to ſuch a bigneſs, that his viſage was ſo much altered, that his friends knew him not; neither could he ſpeak, heare, or ſwallow any thing but what was very liquid. Which I obſerving, although I knew, that the day paſt, which was the eight day of his diſeaſe, he had foure ſaucers of blood taken from him by *Germaine Agace* Barber-ſurgeon of the ſame ſuburbs; yet conſidering the integrity and conſtancy of the ſtrength of the Patient, I thought good to bleed him again; wherefore I drew from him fourteen ſaucers at that one time; when I came to him the day after, & ſaw that neither the feaver, nor any of the fore mentioned ſymptomes were any whit remitted, or aſſwaged, I forthwith took from him foure ſaucers more; which in all made two and twenty; the day following when I had obſerved, that the ſymptomes were no whit leſſened, I durſt not preſume by my own only advice, to let him the fourth time blood as I deſired. Wherefore I brought unto him, that moſt famous Phyſitian Doctor *Violene*, who as ſoon as he felt his pulſe, knowing by the vehemency thereof, the ſtrength of the Patient, and moreover conſidering the greatneſs of the inflammation & tumor which offered it ſelf to his ſight, he bid me preſently take out my Lancet and open a vein. But I lingred on ſet purpoſe, and told him, that he had already twenty two ſaucers of blood taken from him: Then ſaid he, Grant it be ſo, and though more have been drawn, yet muſt we not therefore deſiſt from our enterpriſe, eſpecially ſeeing the two chiefe Indications of blood-letting yet remain, that is, the greatneſs of the diſeaſe, and the conſtant ſtrength of the Patient. I being glad of this, tooke three ſaucers more of blood, he ſtanding by, and was ready to take more but that he wiſhed me to defer it untill the after noon; wherefore returning after dinner I filled two ſaucers more, ſo that in all, this young man to his great benefit, loſt twenty ſeaven ſaucers of blood at five times, within the ſpace of foure dayes. Now the enſuing night was very pleaſing to him, the feaver left him about noon, the tumor grew much leſſe, the heat of the inflammation was aſſwaged in al parts, except in his eyelids, and the laps of his ears, which being ulcerated caſt forth a great quantity of *Pus* or matter. I have recited this hiſtory purpoſely, to take away the childiſh feare which many have to draw blood in the conſtant ſtrength of the Patient, and that it might appear how ſpeedy and certain a remedy it is in inflammations of the head and brain. A Hiſtory. The two chief Indications in blood-letting.

Now to return from whence we digreſſed, you muſt note that nothing is ſo hurtfull in fractures and wounds of the head, as venery; not only at that time the diſeaſe is preſent, but alſo long after the cure thereof. For great plenty of ſpirits are contained in a ſmall quantity of ſeed, and the greateſt part thereof flowes from the brain; hence therefore all the faculties, but chiefly the Animall, are reſolved, whence I have divers times obſerved death to enſue in ſmall wounds of the head, yea when they have been agglutinated and united. All paſſions of the mind muſt in like ſort be avoided, becauſe they by contraction and diſſipation of the ſpirits cauſe great trouble in the body and mind. Let a place be choſen for the Patient as far from noiſe as can be, as from the ringing of bells, beatings and knockings of Smiths, Coopers, and Carpenters, and from high-wayes through which they uſe to drive Coaches; for noiſe encreaſes pain, cauſes a feaver, and brings many other ſymptomes. The diſcommodities of venery in wounds of the head. How hurtfull noyſe is to the fractures of the skull.

I remember when I was at *Hiſdin* at the time that it was beſieged by the forces of *Charles* the fifth, that when the wall was beaten with the Cannon, the noiſe of the Ordnance cauſed grievous torment to all thoſe which were ſick, but eſpecially thoſe that were wounded on their heads, ſo that they would ſay; that they thought at the diſcharging of every Cannon that they were cruelly ſtrucken with ſtaves on that part which was wounded, and verily their wounds were ſo angred herewith, that they bled much, and by their pain and feavers encreaſed, were forced with much ſighing to breath their laſt. Thus much may ſerve to be ſpoken of the cure in generall, now we will out of the monuments of the ancients, treat of the particular. A Hiſtory.

CHAP. XV. *Of the particular cure of wounds of the head, and of the muſculous skin.*

LEt us begin with a ſimple wound, for whoſe cure the Chirurgeon muſt propoſe one only ſcope, to wit, Union; for unleſſe the wound pierce to the skull, it is cured like other wounds of the fleſhy parts of our bodies. But if it be compound, as many wayes as it is complicate, ſo many indications ſhew themſelves. In theſe the chiefeſt care muſt be had of the more urgent order and cauſe. Of a ſimple wound of the fleſh and the skin.

Therefore if the wound shall be simple and superficiary, then the haire must first be shaven away, then a plaister applyed made of the white of an egge, bole Armenick and Aloes. The following day you must apply *Emplastrum de Ianua* or else *de gratia Dei*, untill the wound be perfectly healed. But if it be deeper and penetrate even to the *Pericranium*, the Chirurgeon shall not do amiss, if at the second dressing he apply a digestive medicine (as they call it) which may be made of Venice Turpentine, the yolks of egges, oyl of Roses, and a little Saffron, and that shall be used so long, untill the wound come to maturation; for then you must add honey of Roses and Barly floure to the digestive. Hence must we pass to these medicines, into whose composition no oyly or unctuous bodie enters, such as this; R *Terebinth. venet.* ℥ ij, *syrupi rosar.* ℥ j, *pul. aloes, Myrrhæ, & mastich. an.* ℥ ß. Let them all be incorporated and made into an unguent, which shall be perfectly regenerated, then it must be cicatrized with this following powder. R, *Aluminis combusti, corticis granatorum combust. an* ℥ j, *Misceantur simul & fiat pulvis*: but if the wound be so large that it require a suture, it shall have so many stitches, with a needle, as need shall seem to require.

A digestive medicine.

A sarcotick medicine.

An Epulotick.

Whilst I was at *Hisdin*, a certain souldier, by falling of the earth whilst he undermined, had the Hairy scalp so pressed down even to the *Pericranium*, and so wholly separated from the beginning of the hind part of his head, even to his forehead, that it hung over his face. I went about the cure in this manner; I first washt all the wound with wine, a little warmed, that so I might wash away the congealed blood mixed with the earth; then I dryed it with a soft linnen cloth, and laid upon it Venice-Turpentine mixed with a little *Aqua-vitæ* wherein I had dissolved some *Sanguis Draconis*, Mastick and Aloes; then I restored the hanging skin to its former place, and there staied it with some stitches, being neither too strait, nor too close together, for fear of pain and inflammation, (which two chiefly happen whilst the wound comes to suppuration) but only as much as should serve to stay it on every side, and to keep forth the air, which by its entrance doth much harm to wounds: the lower sides of the wound, I filled with somewhat long and broad tents, that the matter might have passage forth. Then I applyed this following cataplasm to all the head. R, *farinæ hord. & fabarum an.* ℥ vi. *olei rosati*, ℥ iij, *aceti quantum sufficit, fiat cataplasma ad formam pultis*; this hath a faculty to dry, cool, repell, mitigate pain and inflammation and stay bleeding.

A History.

What things we must observe in sewing.

I did not let him blood, because he had bled much, especially at certain arteries which were broken neer his temples; he being dressed after this manner grew well in a short time. But if the wound be made by the biting of a wild beast, it must be handled after another manner, as shall appear by this following history. As many people on a time stood looking upon the Kings Lyons, who were kept in the Tilt-yard at *Paris*, for the delight of King *Henry* the second, and at his charges: it happened that one of the fiercest of them broke the things wherein he was tyed, and leaping amongst the company, he with his paws threw to the ground a Girl of some twelve yeers old, and taking her head in his mouth, with his teeth wounded the musculous skin in many places, yet hurt not the skul. She scarse at length delivered by the Master of the Lyons from the jaws of Death and the Lyon, was committed to the cure of *Rowland Claret* Chirurgeon; who was there present by chance at the same time; some few dayes after, I was called to visit her; she was in a feaver, her head, shoulders, brest, and all the places where the Lyon had set his teeth, or nails, were swoln, all the edges of the wound were livid, and did flow with a waterish, acrid, virulent, cadaverous, dark green and stinking matter, so that I could scarse indure the smell thereof; she was also oppress with pricking, biting and very great pain; which I observing, that old saying came into my mind, which is: That all wounds made by the bitings of beasts, or of men also, do somewhat participate of poyson. Wherefore there must principally great care be had of the venenate impression left in the wounds by the nails & teeth, and therefore such things must be applyed, as have power to overcome poyson. Wherefore I scarified the lips of the wounds in divers places, and applyed Leeches to suck out the venenate blood, and ease the inflammation of the parts, then I made a Lotion of *Ægyptiacum* Treacle and Mithridate after the following manner.

When we must not let blood in wounds.

A History.

The bitings of man and beasts are venenate.

R, *Mithrid.* ℥ j, *theriac.* ℥ ij, *ægyptiac.* ℥ ß, *dissolvantur omnia cum aqua vitæ, & Cardui ben.* Let the wounds be fomented and washed with it warm; besides also Treacle and Mithridate were put in all the medicines which were either applyed or put into the wound; and also of the same with the conserves of Roses and Bugloss dissolved in the water of Sorrell and *Carduus benedictus*, potions were made to strengthen the heart and vindicate it from malign vapors.

Theriacall topick Medicines.

A Cordiall Epithema.

For which purpose also this following *Epithema* was applyed to the region of her heart. R, *aquæ rosar. & nenuphar, an.* ℥ iiij, *aceti scillitici* ℥ j, *coralliorum, santalorum alborum & rubrorum, rosar. rub. pulveris, spodii. an.* ℥ j, *Mithridatii, theriacæ an.* ℥ ij, *flo. cordial. pulveri satorum* ℈ ij, *croci* ℥ j, dissolve them all together, make an Epitheme and apply it to the heart with a scarlet cloth or spunge, and let it be often renued. Verily she dresst after this manner, and the former remedies but once used, pain, inflammation and all the malign symptomes were much lessened; to conclude, shee recovered, but lingred and was lean some two years after, yet at length she was perfectly restored to her health and former nature. By which you may understand, that simple wounds must be handled after another manner, than these which have any touch of poison.

The cure of the Hairy scalp when it is contused.

A repelling medicine.

But now that we may prosecute the other affects of the hairy scalp; say that it is contused with a blow without a wound, that which must be first and alwayes done, (that so the affect may better appear, and the remedies which are applyed may take more effect) the hair must be shaven away, and at the first dressing a repelling medicine applyed, such as this following *Oxyrh odinum*. R. *ol. ros.* ℥ iij, *album ovorum nu.* ij, *pulveris nucum cypressi, balaust. alumin. rochæ. rosar. rub. an.* ℥ j. Let them be all incorporated, and make a medicine for the former use, or in stead thereof you may apply the cataplasm prescribed before consisting of *Farina hordei, fabarum, aceto & oleo rosaceo*. But such medicines must be often renued. When the pain and defluxion are appeased, we must use discussing medicines for dissipation of

that

that humor which remains impacted in the part; R *Emplastri de mucilagin.* ℥ij. *oxicrocei, & emp. de melilo-to, an.* ℥j. *olei cham.em. & anethi, an.* ℥ß. *malaxentur simul et fiat emplastrum ad usum dictum.* Such a fomentation will also be good. R *vini rub. lib.* iiij. *lixivii. com. lib.* ij. *nuces cupressi contus. nu.* x. *pul. myrtillorum* ℥j. *ros. ar. rub. absinth. fol. salviæ, majoranæ, stœchados, florum cham.em. melil. an. M.* ß. *aluminis rochæ, radicis cyperi, calami aromatici an.* ℥ß. *bulliant omnia simul,* and make a decoction to foment the grieved part. After somewhat a long fomenting it, whereby it may the better discusse, dry and exhaust the concrete humor, the head must be dryed and more discussing things applyed, such as the Cerate described by *Vigo* called *de minio*; which hath an emollient and digestive facultie in this form. R *Olei cham. an. lilior. an.* ℥x. *olei mastich.* ℥ij. *pinguedinis vervecis lib.* j. *litharg. auri,* ℥viij. *minii* ℥ij. *vini boni cyathum unum, bulliant omnia simul baculo agitando, primum quidem lento igne, mox verò luculentiore, donec tota massa colorem nigrum vel subnigrum contrahat; adde in fine coctur. Terebinth. lib.* ß. *pulveris mastich.* ℥ij. *gum. elemi* ℥j. *ceræ quantum sufficit, bulliant rursus una ebullitione & fiat empl. molle.* But if the humor be not thus discussed, but onely grow soft, then the tumor must be quickly opened, for when the flesh is inflamed and putrefied through occasion of the contained humor, the bone under it putrefies also by the contagion of the inflamation and the acrimony of the matter falling upon the bone. When you have opened it, wash away the filth of the ulcer with this following detersive medicine. R. *syrupi ros. & absinth. an.* ℥j. *terebinth.* ℥ ß. *pul. ireos, aloes, mastichis, myrrhæ, farinæ hordei an.* ℥ß. In stead hereof if there be great putrefaction, *Ægyptia* either by it selfe, or mixt with an equall quantity of *Vnguentum apostolorum* may be put into the ulcer. When the ulcer is clensed it will be time to use sarcotick and cicatrizing medicines.

A discuss. fing Fomentation.

Cerænm de Minio.

Deterstive or cleansing medicines.

CHAP. XVI. *Of the particular cure of a fracture or broken skull.*

IF the skull be broken, so that it be needfull to trepan it, or to elevate and lift it up, or scrape it away, the musculous skin being cut as we formerly noted, the *Pericranium* shall be plucked from the skull, as we said before; which because it can hardly be done without great pain, by reason of its exquisite sense and connexion with the membranes of the braine, wee must labour to mitigate the paine for feare of inflammation and other accidents. Therefore the first dressing ended & the corners of the wound drawn each from other; at the second dressing put to the wound, a digestive (as they terme it) made of the yolk of an egge, and oyle of Roses, but you must apply no humid thing to the bone, because we desire to keep it sound and whole. For *Galens* opinion is, that bared bones must not be touched with unctuous things; but rather on the contrary all dry things must be applyed to them, which may consume the superfluous humidity. Therefore we must lay some lint and the cephalick powders which we shall hereafter describe, upon the bone we intend to preserve, and must have diligent care that it be not offended either by the ayre, or touch of humid medicines. You must in Trepaning have a speciall care of the *Crassa meninx*. For I have often observed a great quantity of blood to have flowed from some broken vessell, which adhered to the second Table: neither must we presently and forthwith stay such bleeding, but suffer it to flow according to the plenitude and strength of the patient; for thus the feaver, and together therewith the rest of the symptomes are diminished. For the opinion of *Hippocrates*, in every green wound it is good to cause often bleeding, except in the bellies; for thus the vehemency of pain, inflamation and other accidents will be less troublesome; also it is not amisse too for old ulcers to bleed much, for so they are freed from the burden of the impact humors. When you think it hath bled sufficiently, it may be stanched with this following medicine described by *Galen.*

Why the *Pericranium* hath such exquisite sense.

Gal. 6. meth. The bones are offended with the application of humid things.

Lib. de ulcer.

R *pulveris Aloes* ℥ij. *thuris mastiches, an.* ℥ß. *albumina ovorum nu.* ij. *agitentur simul cum pilis leporinis minutim incisis, fiat medicamentum.* When the bleeding is stayed, you shall for the asswaging of pain, drop upon the *Meninx* some Pigeons blood, yet warme by opening a Vein under the wing, then it shall be strewed over with this following powder, R *Aloes, thuris, myrrhæ, sanguinis draconis an.* ℥j. *Misce, fiat pulvis subtilis.* Also you may make an irrigation with Rose Vinegar, or some repelling medicine; such as is a cataplasme *ex farinis, & oleo rosaceo.* Which may be applyed untill the fourth day to asswage and mitigate pain.

Gal. 6. meth.

Vigoes Cerate will be of good use in this case, as that which in my opinion is most fit for fractures of the skull, because it draws powerfully, resolves and dryes moderately, and by reason of the smell refreshes the animall spirits, and strengthens the brain and membranes thereof, as you may easily perceive by things which enter into the composition thereof. R *Olei ros. Omph. resinæ pini, gummi Elemi, an.* ℥ij. *Mastiches* ℥ iß. *pinguedinis vervecis castrati* ℥ ijß. *foliorum beton. caprifol. antbos an. M.j. ammoniaci* ℥ß. *granorum tinctorum* ℥x. *liquata pinguedin et erenda terantur, & ammoniacum simul cum aceto scillitico, eliquetur; deinde bulliant omnia simul in lib.* ij. *vini boni, lento igne usque ad consumptionem vini, deinde exprimantur; cum expressione addantur terebinth. Ven.* ℥iiij. *ceræ albæ quantum sufficit, fiat cerotum molle ad usum prædictum.* Also let the neck, and all the spine of the back be anointed with a liniment, which hath force of mollifing the Nerves, lest they should suffer convulsion; such is this.

Vigoes Cerate good for a broken skull.

A liniment good against convulsions.

R *Rutæ, marrubii, rorismar. ebuler salviæ, berb. paralys. an. M.s. radi Ireos, cyperi, baccarum lauri, an.* ℥j. *florum cham. melil. hyperici, an. M.j. pistentur & macerentur omnia in vino albo per noctem, deinde coquantur in vase duplici cum oleo lumbricorum, liliorum, de terebinthina, axungiæ, anseris & bubn. an.* ℥ij. *usque ad consumptionem vini, postea colentur & in colatura adde terebinth. venet.* ℥iij *aquæ vitæ* ß. *ceræ quantum sufficit. fiat linimentum secundum artem.*

But when the pain is asswaged, we must abstain from all such unctuous things, lest they make the wound become sordid and malign, and putrefie the adjacent parts, and consequently the *Crassa meninx* and skull; for the integrity of all parts may be preserved by their like, and such are dry things in a fracture of the skull. Wherefore all humid and oyly things must be shunned in the cure thereof, unless peradventure there shal be some need to mitigate pain & bring the humor to suppuration.

For according to *Galen*, we are oft forc'd for a time to omit the proper cure of the disease, so to resist

Gal. 4 meth.

How farre humid things are good for a fractured skull.

reſiſt the ſymptomes; furthermore *Hippocrates* would have us not to foment the skull, no not with wine, but if we do, to let it be but with very little. *Vidius* interprets that little to be, when there is fear of inflamation; for wine if it be red, tart and aſtringent, hath a repreſſing, refrigerating and drying faculty: for otherwiſe all wine although it heats and dryes by its faculty, yet it actually humects and cools, both which are very hurtfull in wounds of the head, or a fractured skull, eſpecially when the bone is bare; for from too much cooling of the brain there is fear of a convulſion, or ſome other evill ſymptome. Wherefore let this be ratified, that is, We muſt not uſe humid and unctuous medicines in wounds of the head, except for curing of an inflamation, or the mitigation of pain cauſed thereby. Therefore let the bared skull be ſtrewed with catagmatick and cephalick powders, (being ſo called by the Ancients, for that they are convenient and good in fractures of the skull and the reſt of the bones) for by their dryneſs they conſume the ſuperfluous humidity, and by that means help nature in the ſeparating of the broken bones, and the regenerating of fleſh. Such powders uſually conſiſt of ſuch things as theſe enſuing. *Thur, radix Iridos florent. farina hordei, & Ervi, pulvis Aloes Hepatica, ſanguis Draconis, maſtiche, Myrrha, rad. Ariſtolochiæ, Gentianæ*: and generally all ſuch ſimples as have a drying and an abſtergent faculty without biting; but you muſt not uſe theſe things before the pain, inflamation and apoſtumation be paſt; that is then, when the membranes muſt be clenſed, the bones ſealed, and the fleſh generated. For the skul by how much it is the dryer, by ſo much it requires and more eaſily endures more powerfull and dryer medicines than the *Dura Mater* or *Pericranium*, as that which in quickneſs of ſenſe comes far ſhort of theſe two. Wherefore when you would apply the forementioned cephalick powders to the *Meninges*, they muſt be aſſociated and mixed with hony, ſyrup of roſes or of wormwood and ſuch other like, that ſo their too violently drying faculty may be allayed and tempered.

Why Cephalick or Catagmatick powders are good.

When to be uſed. How to be mixed when they are to be applyed to the *Meninges*.

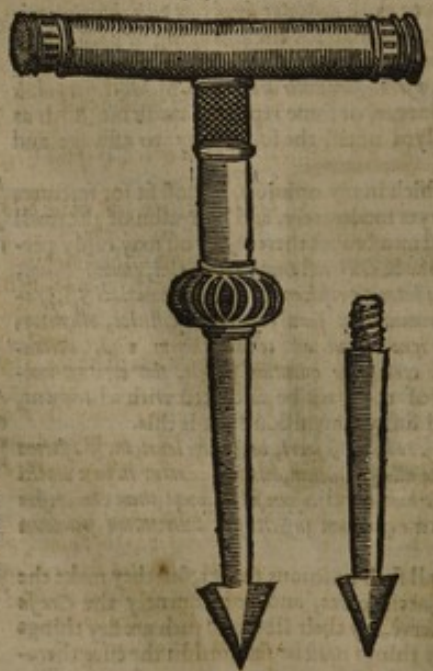
CHAP. XVII. *Why we uſe Trepaning, in the Fractures of the Skull.*

THere are four cauſes of this remedy: The firſt is, to raiſe up the depreſt bones, and take forth their fragments, which preſs upon the *Meninges*, or alſo upon the ſubſtance of the brain. The ſecond is, that the *Sanies* or matter may be evacuated, clenſed, waſted, and dryed up, which by the breaking of any veſſell is poured forth upon the Membranes, whereby they are, and not they only, but the brain alſo is in great danger of corruption. The third is, for the fitter application of medicines, convenient for the wound and fracture. The fourth is, that ſo we may have ſomething whereby we may ſupply the defect of a Repelling Ligature, & ſuch an one as may hinder defluxions; for ſuch a Ligature cannot take place here as it may in the other parts of the body, by reaſon of the Sphæricall or Round figure of the head, which doth not eaſily admit binding; & then the denſity and hardneſs of the interpoſed skull is a means that the veſſels lying under it (by which uſually the defluxion comes) cannot eaſily be bound with a rowler ſufficiently to repell the running blood. And the externall veſſels, (to whom the force of the Ligature may come) cannot be bound without great pain, and danger of inflamation. For by ſuch a compreſſion the pulſation of the Arteries would be intercepted, and the efflux of the ſuliginous excrements which uſeth to paſs through the ſutures of the skull, would be ſuppreſt, by reaſon of the conſtricton of theſe ſutures.

Why a repelling Ligature cannot be uſed in fractures of the skull.

The ſhape of this Inſtrument is not much different from a Gimblet, but that the point is three-ſquare, and not twined like a ſcrew; as you may perceive, by this following figure.

A Gimblet or piercer to perforate the skull, before the ſetting on of the Trepan.



Beſides alſo, the blood would thus be forced from the wounded part without, to within into the Membranes and Brain; when pain, inflammation, a Feaver, Abſceſs, Convulſion, Palſie, Apoplexie, and laſtly, death it ſelf would inſue.

And theſe are the chief cauſes, that Trepaning is neceſſary in fractures of the skull, and not ſo in the fractures of other bones.

How the patient muſt be placed when you Trepan him.

But before you apply or put to your Trepan, the Patient muſt be fitly placed or ſeated, and a double cloth muſt be many times wrapped about his head, and then his head muſt be ſo laid, or preſſed upon a Cuſhion or pillow, that when you come to your operation, it may not ſink down any further, but remain firm and ſtedy. Then you muſt ſtop the Patients ears with Cotten-wooll, that ſo he may not hear the noiſe made by the Trepan or any other Inſtrument.

What to be done before the application of the Trepan.

But before you put to your Trepan, the bone muſt be pierced with an Inſtrument, having a three ſquare point, that ſo it may be the more ſpeedily and certainly perforated. The point thereof muſt be no bigger then the pin of a Trepan, that ſo the Trepan which is forthwith to be applyed may ſtand the more firmer, and not play to and again in too wide a hole.

A. Shews the handle. B. The points which may be ſcrewed and fixed into the handle.

CHAP.

CHAP. XVIII. *A Description of Trepans.*

TRepans are round ſaws, which cut the bone circularly more or leſs according to their greatneſs; they muſt have a pin ſtanding in the middle a little further out than their teeth, ſo to ſtay and hold faſt the Trepan that it ſtir neither to this ſide nor that, until it be entred and you have cut through the firſt table at the leaſt: then you muſt take forth the pin, leſt going quite through the bone, it may prick or hurt the *Craſſa Meninx*. Wherefore when you have taken forth the pin, you may ſafely turn it about untill you have cut through both the tables; Your Trepans muſt alſo have a cap, or ſomewhat to ingirt or incompaſs them, leſt no way hindred they cut more of the bone than we would, and in concluſion run into the *Meninx*. They muſt alſo be anointed with oyl, that ſo they may cut the more readily and gently; for thus Carpenters uſe to greaſe their ſaws. But you muſt, during the time of the operation, often dip them in cold water, leſt the bone by attrition become too hot: for all hard ſolid bodies by quick and often turning about, become hot; but the bone made more hot and dry, is altered and changeth its nature, ſo that after it is cut, more of it ſcales and falls away. Now you muſt know that the bone, which is touched with the Trepan, or the Air, alwayes caſts off ſcales, for the ſpeedier helping forwards whereof, you muſt ſtrew upon it powders made of Rocket, Briony, wild Coucumber & *Ariſtolochia* roots. When the bone is ſufficiently ſcaled, let this following powder be put upon it, which hath a faculty to cover the bone with fleſh, and and to harden it with dryneſs convenient to its kind. ℞ *Pulver. Ireos Illyricæ, Aloes, Mannæ thuris, Myrrhæ, ariſtolochiæ an.* ʒ j. Fleſh being by this means generated, let it be cicatrized by ſtrewing upon it the rinds of Pomegranats and Alum burnt.

The harm the bone receives by being heated with the Trepan. What things haſten the ſcaling of the bone.

Neither ſhall the Chirurgeon forcibly take away theſe ſcales, but commit that whole work to nature, which uſeth not to caſt them off before that it hath generated fleſh under them. For otherwiſe if he do any thing raſhly, he brings new corruption to the bone; as we ſhall more at large declare, when we come to treat of *Caries* or rottenneſs of bones.

The bone muſt not be forcibly ſcaled.

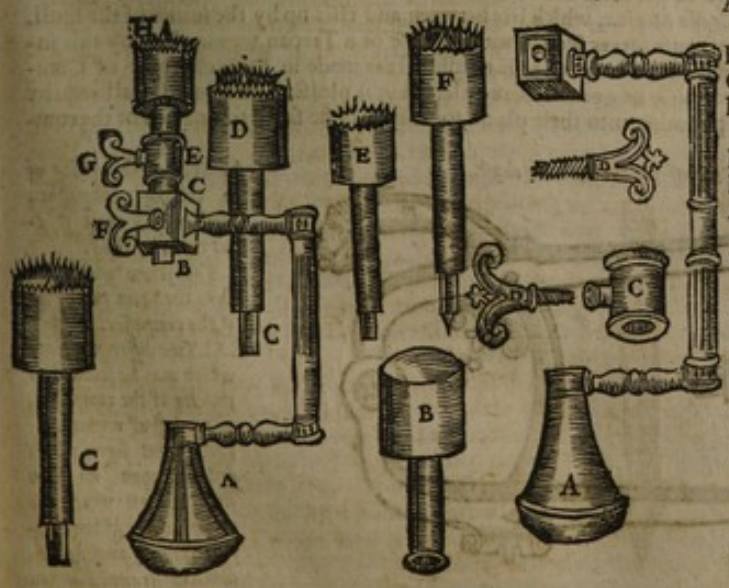
He which uſeth the Trepan, muſt conſider this, that the head is of a round figure, and alſo the Trepan cuts circularly, and therefore it is unpoſſible to cut the bone ſo equally on every ſide, as if it were performed upon a plain body. Furthermore the thickneſs of the skull is not alike in all places, wherefore you muſt look, and mark whether the Trepan go not more deep on one ſide than on the other, which you may do by meaſuring it now and then with a pin or needle, and if yee find that it is cut deeper on one ſide, than on the other, you muſt preſs down the Trepan more powerfully upon the oppoſite part.

A caution in Trepaning.

But ſeeing there are many ſorts of Trepans invented and expreſſed by many men, yet if you weigh and rightly conſider them all, you ſhall find none more ſafe, than that I invented and have here delineated. For it cannot pierce one jot further into the skull, than he pleaſes that uſes it, and therefore it cannot hurt either the *Meninges* or the Brain. An Iron head or cover ſtayes it as a bar, that it can penetrare no further than you ſhall think it requiſite. This head or cover is to be drawn up and down, and ſet higher and lower, as he which uſes it ſhall think good, and ſo it will ſtay the Trepan that it ſhall not goe a hairs bredth beyond your intended depth. So that henceforwards there ſhall be no Chirurgeon, howſoever ignorant in the performance of his Art, which by the benefit of ſuch a Trepan may not perform this operation without any danger or fear of danger of touching the *Dura Mater*, the hurting whereof, puts the life in jeopardy.

A ſafe and convenient Trepan.

The figure of our Trepan opened and taken in pieces. *The figure of the ſame Trepan fitted and put together.*

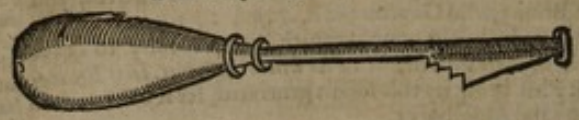


A. *Shews the whole handle or Brace of the Trepan.*
B. *The Cover or Cap of the Trepan.*
C. *The ferule.*
D.D. *The ſcrew pins which hold and ſtay the ferule and Trepan.*
E. *The Trepan without his pin.*
F. *The Trepan furniſhed with its pin.*
A. *Shews the Brace and Trepan fitted in every point.*
B. *The place into which the Trepan is put and fitted.*
C.C.C. *The upper end of the trepan which is to be fitted and put into the Brain.*
D. *The Trepan with its cover or cap upon it.*
E. *The ferule.*
F. *A ſcrew pin by the twining whereof the Trepan is faſtened in the Brace.*
G. *Another ſcrew pin which faſtens the ferule cloſer to the Trepan.*
H. *The three ſquare point.*

In ſtead of the other Trepan ſet forth by the Author, I have thought fit to give you the figure of that Trepan that is here moſt in uſe, and the fitteſt therefore, as it is ſet forth by Mr. Doctor *Crook*.

A Terebellum or Gimblet conſiſting of three branches.

A Lentill-like cutting Scraper.



All theſe particulars of the Trepan taken in ſunder, you may ſee united and fitted together in the other figure. But when you cannot bring out the bone which you have cut off with your Trepan, then you may take it forth with the *Terebellum* or Gimblet here expreſt, that is, ſcrewing the point thereof into the hole made by the threeſquare pin; the handle of this Inſtrument may alſo ſerve in ſtead of a Levatory. When with the Gimblet you have drawn or taken forth that part of the ſkull which was cut away by the Trepan; if there ſhall be any ſharp ſplinters in the ſecond table, which may hurt and prick the *Meninx*, when it is heaved up by the motion of the brain, they muſt be ſhaved away and planed with this Lentill faſhioned ſcraper, being ſo called, becauſe it hath the head thereof faſhioned and ſmooth like a Lentill, leſt being ſharpe it ſhould hurt and prick the membrane in the ſmoothing thereof.

The uſe of a Leaden Mallet.

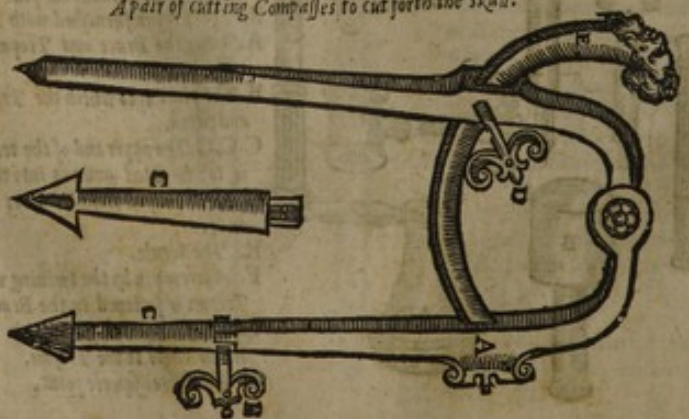
But if by reaſon of the thickneſs, the ſkull cannot be cut with this Lentill-like ſcraper, you may uſe the cutting ſcrapers and a Mallet. The mallet muſt be of lead, that ſo it may ſhake the brain as little as may be. But you muſt diligently with your mullets take forth the ſharp ſplinters, and peeces of the bone. But if the fractured part of the ſkul be ſuch, that it will not admit that ſection which is requiſite for the bared bone, as when the fracture is upon the temporall muſcle, or at the ſutures; then in the ſtead of one Trepan, two or three muſt be applyed, if the neceſſity of the preſent caſe ſo require, and that within a very ſmall compaſs; but they muſt not be applyed to the fractureed part, but nigh thereto, as we ſhall ſhew more at large in the following chapter. But the Trepans ſhall be applyed ſo neer to each other, that the ring of the ſecond may be joyned with the ring of the firſt and third. But if a fracture ſhall happen to light upon a ſuture, then you muſt not apply a Trepan to it, but uſe two thereto on each ſide; he that ſhall do otherwiſe, ſhall tear in ſunder the nervous and membranous fibers, and alſo the veins and arteries by which the *Dura Mater* is faſtened to the skull, and yeelds matter to the *Pericranium*. He which ſhall apply one Trepan, that is, but upon one ſide of the ſuture, he ſhall not be able to get forth all the *ſanies* which is fallen down on both ſides by reaſon of the partition of the *Craſſa Meninx*, which lies between, and riſes up by the future of the skull.

VVhy a Trepan muſt not be applyed to the ſutures.

VVhy two Trepans are to be uſed to a fractured ſuture.

To conclude, when for what cauſe ſoever we cannot make uſe of a Trepan, we may imploy this inſtrument, if ſo be as much of the bone be bared as is needfull. It is made in form of a pair of Compaſſes, and by means of a ſcrew may be opened more or leſs as you pleaſe. You as need ſhall require may change the points, and put other into their places, for they may be fitted to one ſide of the compaſs with a ſcrew.

A pair of cutting Compaſſes to cut forth the ſkull.



A. *Shews the one leg of the cutting compaſſes, which as you carry it about cuts the skull.*

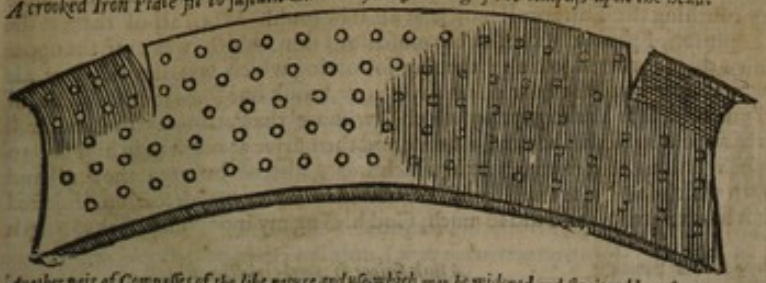
B. *The ſcrew which faſtens the point to the leg of the compaſſes.*

C. C. *Two different points which may be ſcrewed to the leg of the compaſſes, as need ſhall require.*

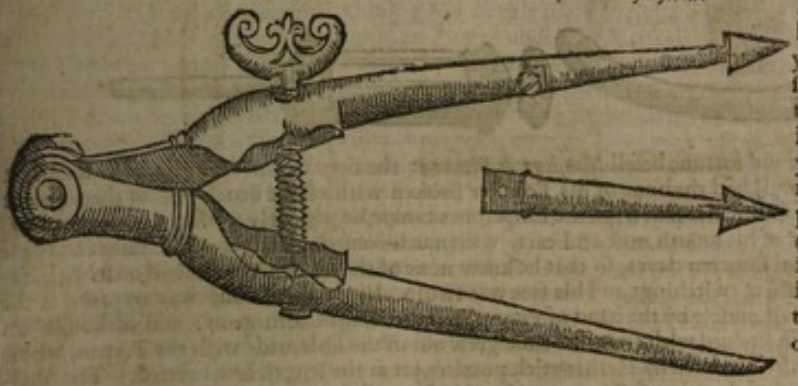
D. *A great ſcrew which faſtens upon an Iron ſtring, alongſt which the one of the legs of the compaſs running, may be widened & ſtreitned as you pleaſe.*

More-

A crooked Iron Plate fit to sustain and hold steddy one leg of the compass upon the head.



Another pair of Compasses of the like nature and use, which may be widened and straitned by a screw.



Moreover it is fit that the one leg of such cutting compasses should stand firm and steddy, whilst the other is drawn circularly to cut. Wherefore it is fit you have an Iron plate made full of little holes, wherein you may firmly stay that leg of the compass, lest it waver against your will; it is requisite that this plate be crooked, (because the head is round) that so it may be fitted to any part thereof.

CHAP. XIX. *Of the places of the skull whereto you may not apply a Trepan.*

FIrst of all, you shall not apply a Trepan, to a bone that is so broken that it is wholly, or in the greater part thereof divided from the skull by the violence of the stroak, left by your weight & pressing of the trepan, you force it down upon the membrane. Secondly, you must not apply one to the fractured Sutures, for the reasons mentioned in the former chapter. Thirdly, nor to that part of the forehead which is a little above the eye-browes, for these reasons we gave you before in the twelfth chapter. For there is in that place under the first table of the skull it selfe, a large cavity repleniished with a certain white and tough humor, as also with a certain spirituous and ayrie substance, placed there by nature, to prepare the aire which ascends to the brain by the Nostrils: unlesse the Chirurgeon observe and be mindfull hereof, he may be deceived, supposing this cavity to be an Effracture of the bone and a depression thereof. Fourthly, neither in the lowest parts of the skull, lest the marrowy substance of the Brain, by reason of its weight, should slide through the hole made by the Trepan. Fifthly, neither to the *Bregma* bones of Children, as those which as yet have not acquired just solidity, to endure the impression of a Trepan. Sixtly, nor to the temples by reason of the Temporall muscle, the cutting whereof in the opinion of *Hippocrates* causes convulsion of the opposite part. For being cut athwart it loses its proper action, that is, to move and lift up the lower Iaw; but then the opposite Temporall muscle being whole and perfect, using its strength, (his antagonist suffering it, and not resisting or labouring any thing at al to the contrary) it draws the same Iaw to it, whereupon the mouth and all the parts of the face are drawn awry, and suffer a Convulsion towards the sound part, the other being resolved according to *Hippocrates* his rule. For as often as the muscles of one kind are equall in number, magnitude and strength on each side, the resolution of the one part, causes the Convulsion of the other.

A bone almost severed from the skull must not be trepaned.

A notable cavity in the forehead bone.

Lib. de Vul.

A rule out of *Hippocrates*.

Neither doth this danger alone arise from the cutting of the Temporall muscle, but also another, which is, that this muscle when we eat and speak, is in perpetuall motion, whereby it comes to pass, that being once cut it is scarse ever united again, besides also the commissure or joyning together of the stony bones lye under it. But by the second caution we are forbid to trepan upon the sutures; moreover also many veins, arteries and nerves are spred over the substance thereof, so that by cutting of them, there is danger of many and malign symptomes, as pain, inflamation, a feaver, a convulsion not only of the part it self, but also of the whole body, whence lastly death insues. Wherefore let no Chirurgeon be so fool hardy, as to attempt the cutting of this muscle so to trepan the bone which lies under it; rather let him apply his Trepan above it, or on the side thereof, or as neer to the affected part as he can, as I did in a Gentleman called *Monsieur dela Bretesche*. He in the triumphant entrance of King *Henry* the second, into the City of *Paris*, was so hurt with a stone, that the *Os Petrosum* or scaly bone, was broken with the violence of the blow, and the temporall muscle was vehemently contused, yet without any wound. I being called the next day (viewing the manner of the hurt, & the condition of the wounded part) thought good to bring some Physitians, and Chirurgeons with me to consult hereof, of whom when some thought it expedient presently to divide the temporal muscle that baring the bone we might apply a Trepan, and so take forth the broken bones: I on the contrary, begun earnestly to withstand that opinion, citing that saying of *Hippocrates*, *ex libro de vulneribus Capitis*, wherein Chirurgeons are forbidden to cut such muscles, for fear of the forementioned symptomes; also I cited experience, how that I had often observed all those which had this muscle cut

What discommodities arise from curting the temporall muscles.

A History.

cut,dyed with a convulſion;but that it ſhould be far better, that neer above the fracture the bone ſhould be trepaned, not touching the Temporall muſcle at all if he could. When all of them at the laſt had inclined to my opinion, I preſently divided the muſculous skin which was over the upper part of the fracture with a three cornered ſection: the day following which was the third of his diſeaſe,I trepaned him, and after I had done,ſome few dayes after,I took out ſome four ſplinters of the broken bone;and I put in a plain leaden pipe,by which(I wiſhing the Patient ever when I dreſt him to hold down his head,to ſtop his mouth and his noſe,and then ſtrive as much as in him lay to put forth his breath)much ſanious matter came forth,which was gathered between the skull and *Craſſa Meninx*.Other filth which ſtuck more faſt, I waſhed out with a detergent decoction, injected with ſuch a ſyringe as is here expreſt; And I did ſo much, God bleſſing my indeavours,that at length he recovered.

A plaine leaden pipe for to carry forth the Sanies gathered under the skull.

A little ſyringe fit to make injections withall.

A hiſtory.

The like chance and fortune befell *Monſieur de Pienne* at the ſiege of *Mets*. For he as he fought at the breach of the wall,had the bone of his Temples broken with a ſtone ſtruck out of the adjacent wall,by a peece of Ordinance ſhot from the Emperours campe,he preſently fel down with the blow, and caſt blood out of his mouth,noſe and ears, with much vomiting,and remained dumb and as it were ſenſleſs almoſt fourteen dayes, ſo that he knew none of the by-ſtanders. He had often palpitations; and convulſive twitchings,and his face was ſwoln. His forehead bone was trepaned at the ſide of the temporall muſcle by the hand of *Peter Aubert* the Kings Chirurgeon: and although on the 25.day,ſoft fleſh endued with exquiſite ſenſe grew out of the hole made with the Trepan, whoſe growth could not be hindered by Cathæretick pouders,yet at the length he recovered. The Ancients called this kind of growing fleſh a *Fungus* [*i.*a Muſhrome] for that it is ſoft, and grows with a ſmall root and broad top like a muſhrome:but it increaſes and decreaſes,according to the plenty of the flowing matter, and induſtry of the Chirurgeon hindering by art the growth thereof. This fleſh ſtinks exceedingly,they commonly call it*Ficus ſanctii Fiacrii* [*i.*the fig of S. *Fiacre*.]This diſeaſe commonly hath its original after this manner.Even as in the bodies of trees from the excrements of nouriſhment,a certain half putrid,groſs and viſcous humor ſweats through the bark, and gathered together by little and little grows into a Muſhrom,ſo blood melancholy both in temper and conſiſtence,ſprings from the broken veſſells of the skull and *Craſſa Meninx*,which alſo is ſent ſometimes by nature for the neceſſary repairing of the fleſh in theſe parts, whereupon a certain *fungus* breeds, which in *Galens* opinion,ſavors or partakes of the nature & conditionof the parts to which it grows though in generall it be of the nature of malign warts, or excreſcences. But for to take away ſuch *Fungi*,you muſt apply medicines which have a ſpecifick faculty to waſt ſuperfluous fleſh; ſuch are theſe which ſtrongly dry,and gently waſt and eat,ſuch as this which follows.℞ *Sabinæ* ʒ ij.*aceæ* ʒj.*pulveriſentur ſimul, aſpergatur caro excreſcens.* Or elſe ℞ *Hermodactylorum combuſtorum* ʒß, make a pouder for the ſame uſe. But if ſo be that this fungous fleſh come to ſuch growth,(as it often happens)as to equall the bigneſs of an egg, it muſt be tied and ſtrait twitched, cloſe to the root with a ſilken thred,and when it ſhall fall away by reaſon of this binding,the place muſt be ſtrewed with the forementioned pouders, for ſo it will be more certainly cured,than with more acrid cathæreticks.

The generation of a *Fungus*.

CHAP. XX. *Of the corruption and* Caries, *or rottenneſs of the bones of the Head.*

Why when the skull is broken the bones ſometimes become foul or rotten.

THere ſometimes follows a corruption and Sphacell of the fractured bones of the skull upon wounds of the head;which happens either becauſe they are touched by the air,which they are not ſenſible of; or for that the *Sanies* putrefying and detained under them,hath infected them with like putrefaction;or by the cure unskilfully handled,they by the raſh application of ſuppurating and oyly medicines becoming more moiſt,and ſo undergoing an unnaturall change of their proper complexion and native temper,as we ſhall ſhew more at large, when we ſhall treat of the reaſon of the *Caries* in the *Lues venerea*.We ſhall know this unnaturall change and corruption,partly by ſight,that is,when from white they become to be yellowiſh,livid and black;partly alſo by putting down a Probe,when as it meets with nothing ſmooth and ſlippery, but feels rough in many places,and beſides alſo when it enters and eaſily penetrates with a ſmall thruſting down into their ſubſtance,as if it were fungous. Yet this laſt ſign may often deceive you,for I have divers times obſerved rotten bones, which being bare had long ſuffered the injury of the air, to become ſo hard that a Trepan would ſcarſe pierce them; for it is putrid humidity which makes the bones ſoft and fungous;but the air by drying them exhauſts this humidity, and laſtly dryes it, whence follows ſuch contumacious harndeſs.This ſign will be far more certain, if the fleſh which is grown upon the bone be more ſoft than is fit,looſe and have little or no ſenſe of feeling. You may correct and amend this corruption of the bone with cauteries as well actuall,as potentiall,or with the powders of Aloes, Gentian, *Ariſtolochia*,centaury, *cortex pini*, as ℞, *radic.Irecos,Flor. ariſtolochiæ an.* ʒ j. *centaur.* ʒ ij,*corticis pini* ʒ ß,*Miſce & fiat pulvis ſubtiliſſimus oſſi inſpergendus.* But if it be much corrupted,it muſt be ſcraped forth with your *Scalpra*.And you muſt expect the falling or ſcaling of the corrupt bone from the ſound,and not forcibly procure it; for otherwiſe the ſound bone,which lies under it,being as yet covered with no fleſh growing over it,would be corrupted by the appulſe, or touch of the air. Yet you ſhall by little and little gently move and ſhake rotten bones with your probe,

Corrupt bones are ſometimes hard.

The ſigns of foulneſs of the bone.

probe, that so they may more easily scale and with less trouble to nature. But note by the way, that the scaling of the bone which hath invironed the Trepan, is commonly performed in the space of forty or fifty dayes. So long also will that caused by the unusuall appulse or touch of the air, or application of a cautery, or the asperson of the Cephalick pouders; besides also in the same number of dayes broken bones may be united and joyned together by a *Callus*, which is to them as a scar, yet sometimes sooner, somewhiles later, according to the variety of the ages, tempers and habits of divers men. But if the *Caries* or *rottennesse* can neither by these fore-mentioned remedies be orecome and amended, neither the loosed continuity agglutinated nor united, you must give the Patient a vulnerary potion, for hence I have found happy success in many. But sometimes not only a certain portion of the bone, is taken with a *Caries*, but also the whole is often seised upon with sphacell, and all fals out. For in *Hippocrates* opinion, *Lib. de vulneribus capitis*, the bone of the skull being broken falls from the sound more or less, according to the violence of the blow; which also is confirmed by experience. For which purpose I think good in this place to recite a History, whereof I was an eye-witness, whilst I served as Chirurgeon in *Piemont* under the Marshall *de Montejan* (who was the Kings Liefstenant there.) It happened that a Lackey of *Monsieur de Goulaines* came to me to be cured; he had the *Bregma* bone of the left side broken with a sword, neither yet did the fracture come to the second Table; a few dayes after his recovery the bone being agglutinated and united, it came to pass that a company of *Gascoine* souldiers his countrymen came to *Turin*, with whom one morning he eat plentifully Tripe fryed with Onions and spices, and drunk a great quantity of strong wine. Whereupon he presently fell into a continuall Feaver, and lost his speech and understanding; his head swelled, his eyes looked red and fiery and as though they would have started out of his head. Which things being considered, I let him blood, having first (by the Physitians advice) given him a Glyster, and applyed to his head such things as were fit; and also I laboured with Frictions and Ligatures of the extream parts to draw the humors downwards; yet for all this the part of the head which was formerly affected begun to impostumate; which being opened, there came forth a great quantity of matter, and at the length the musculous skin and *Pericranium* sinking down, both the Tables of the skull became putrefied and rotten, as you might know by their blackness and stench. Now to take away this corruption, I applyed at certain times actuall cauteries, both to amend the corruption and separate that which was altered: but mark, after some months space, a great number of worms came forth by the holes of the rotten bones from underneath the putrefied skull; which moved me to hasten the separation and falling away of the putrid bones. Which being done, upon the very *Crassa Meninx*, which is more strange, in that place, which nature had covered with flesh, I observed three cavities of the largeness of ones thumb filled with worms about the bigness of a points tag, with black heads, diversly wrapped amongst themselves. The bone which nature separated was of the bigness of the palm of ones hand, so that it was strange that so large a portion of the skull should be cast off by nature, and yet the Patient not dye thereof; for he recovered yet beyond all mens expectation, but after the agglutination of the wound the scar remained very hollow according to the decree of *Hippocrates*. For flesh doth not easily grow upon a *Callus*, because it is a thing strange and supposititious by nature; besides, as a scar is a thing more dense than the skin, so is a *Callus* than the bone, so that through the more compact substance thereof, the blood can neither freely nor plentifully sweat through for matter to regenerate flesh. Hence it is, that wheresoever any portion of the skull is wanting, you may there by putting to of your hand perceive and feel the beating of the brain, wherefore the skull must needs be much weaker in that place. Now to help this infirmity, I wished this Lacky to were a Cap made of thick leather, so more easily to withstand externall injuries: and verily thereby he grew much better. Now I think good in this place to lay open the deceit and craft of some Impostors falsly stiling themselves Chirurgeons, who when they are called to cure wounds of the head, wherein any part of the skull is lost, perswade the Patient and his friends, that they must put a plate of gold in the place of the skull which is wanting. Wherefore they hammer it, in the presence of the Patient, & turne it divers wayes & apply it to the part, the better to fit it; but presently after they slily convey it into their purses, and so leave the patient thus cousened. Others brag that they are able to put the dryed rind of a gourd into the place of the lost bone, and fasten it on to defend the part; and thus they grossely abuse those which are ignorant in the Art. For this is so far from being done that nature will not suffer nor endure so much as an haire, or any other small body to be shut up in a wound when it is cicatrized; neither is the reason alike of a leaden bullet which shot into the body lies there for many years without any harm to the patient; for although lead have a certain familiarity with mans body, yet is it at length (unless the density of the opposed flesh, ligament, tendon, or some other such like substance hinder) thrust forth by nature impatient of all strange bodies. And thus much of the rottennesse and corruption of fractured bones; now must we speak of the discommodities which befall the *Meninges* by wounds whereby the skull is broken.

The benefit of a vulnerary potion.

A History.

A great falling away of a corrupt bone.

Aph. 45. Sect. 6.

The covetous craft of Impostors.

CHAP. XXI. *Of the discommodities which happen to the* Crassa Meninx *by fractures of the skull.*

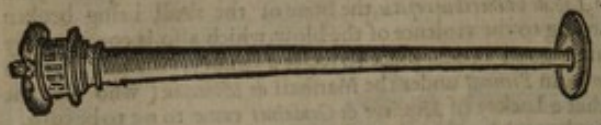
MAny discommodities chiefly happen to the *Crassa meninx* by a fracture of the skull and rash trepaning thereof, for it sometimes chances to be cut and torn. Agglutination is a remedy for this disease, which *Hippocrates* wishes to be procured with the juice of *Nepeta* [that is, of that calamint, which smells like Penny-soyall] mixed with barly floure. In stead whereof this following powder having the like faculty may take place.

℞ *Colophon.* ℥ij. *Myrrhæ, aloes, mastiches, sanguinis Draconis an.* ℥j. *croci, sarcocollæ an.* ℥ß. *misce & fiat pulvis subtilis.* But to purge the blood and matter which is gathered and lyes between the *Crassa meninx* and skull, you shall put in a Tent made of a rag twined up some foure or five double, and steeped in syrup

Remedies for the ulcerated *Meninx.*

rup of Roſes or wormwood and a little *Aqua vitæ*;for thus you ſhal preſs down both the *Craſſa Meninx*,left lifted up by the accuſtomed and native pulſation of the brain,it ſhould be hurt by the edges of the skull, yet rough by reaſon of the ſharp ſplinters of the bone lately trepaned, and give freer paſſage forth for the matter there contained. But as oft as you ſhall dreſs the Patient, you ſhall renue the forementioned Tent,untill all the matter be purged forth. And ſo often alſo you ſhall preſs down with the following inſtrument the *Dura Mater*, and bid the Patient to ſtrive to put forth his breath,ſtopping his mouth and noſe, that ſo the matter may more eaſily be evacuated. This Inſtrument wherewith you ſhall hold down the *Dura Mater*,muſt have the end round, poliſht and ſmooth as it is here expreſt.

A fit Inſtrument to preſs and hold down the Dura Mater,*ſo to make way for the paſſage forth of the* Sanies *or Matter.*



And let there be laid upon the *Dura Mater* ſtrewed over with the formerly mentioned powder, a ſpunge moiſtened and wrung forth of a drying decoction made of aromatick and cephalick things, ſuch as this which followes. ℞ *Fol. ſalviæ,majoran.betonicæ,roſar.rub.abſinth.Myrtil.florum chamæm. melil. ſtæchad.utriuſque an. M.iij.ß.rad.cyperi,calam. aromat.ircos, caryophyllatæ, angelicæ, an.℥ß.bullient omnia ſecundum artem cum aqua fabrorum & vino rubro,fiat decoctio ad uſum dictum.* And in ſtead hereof you may uſe claret with a little *aqua vitæ*,that ſo the contained matter may be evacuated and dryed up. A ſpunge is fitter for this purpoſe to draw than a linnen rag or any other thing,both becauſe it is good of it ſelf to draw forth the humidity,as alſo for that by its ſoftnes it yeelds to the pulſation of the Brain.Then apply to the wound & all the adjoining parts,an emplaſter of *Diacalcitheos* diſſolved with vinegar,or wine, or oyl of Roſes,that ſo the plaſter may be the more cold and ſoft. For in *Hippocrates* opinion, nothing which is any thing heavy or hard muſt be applyed to wounds of the head, neither muſt it be bound with too ſtrait,or hard a ligature,for fear of pain and inflammation.

A ſpunge fit to foment withall.

Lib.de vuln. cap.

Lib.de faſciis.

For *Galen* tells (as he had it from *Mantias*) that a certain man had loſt his eyes by inflammation and impoſtumation ariſing, for that an Apothecary had uſed too ſtrait a ligature to his head and face;for this ſtrait ligature ſo preſſed the ſutures, that the fuliginous vapours, which uſed to paſs through them and the pores of the skull,were ſtopped from paſſing that way;beſides, the beating of the Arteries was intercepted and hindered;by which means the pain and inflammation ſo encreaſed, that his eyes were rent and broke in ſunder and fell forth of their orb. Wherefore *Hippocrates* rightly commends an indifferent ligature: alſo he fitly wiſheth us to let the emplaſters be ſoft which are applyed to the head,as alſo the cloaths wherewith it is bound up, to be of ſoft and thin linnen, or of Cotton,or wooll.When the patient is in dreſſing,if there come much matter out of the wound, you ſhall wiſh him if he can, to lye upon the wound, and now and then by fits to ſtrive to breath, ſtopping his mouth and noſe, that ſo the brain lifted and ſwoln upwards, the matter may be the more readily caſt forth;otherwiſe ſuffer him to lye ſo in his bed,as he ſhall beſt like of,& ſhall be leaſt troubleſome to him. You may with good ſucceſs put upon the *Craſſa Meninx* oyl of Turpentine with a ſmall quantity of *aqua vitæ* and a little Aloes and Saffron finely powdred, to cleanſe or draw forth the *Sanies*,or matter. Or elſe, ℞ *Mellis roſar.℥ij.farinæ hord.pulver.aloes,maſtich.& Ircos florent.an. ℥ß.aqua vitæ parum*;let them be incorporated together & make a deterſive medicine for the foreſaid uſe.

The diſcommodities of too ſtrait binding of the head.

What cloathes we muſt uſe.

How the patient muſt lye in his bed.

Paulus lib. 6.cap.90.

Sometimes alſo the *Craſſa Meninx* is inflamed after Trepaning,and ſwoln by a *Phlegmon*, that impatient of its place,it riſes out of the hole made by the Trepan, and lifts it ſelf much higher then the skull,whence grievous ſymptoms follow. Wherefore to prevent death,of which then we ought to be afraid,we muſt inlarge the former hole with our cutting mullets,that the matter contained under the skull,by reaſon of whoſe quantity the membrane ſwells,may the more freely breath and paſs forth;and then we muſt goe about by the preſcript of the Phyſitian to let him bleed again,to purge and diet him.The inflammation ſhall be reſiſted by the application of contrary remedies,as this following fomentation. ℞ *Sem.lini,althæ,fœn. pſillii,roſ.rub.an.℥j.ſolani,plantag.an. M.j.bullient in aqua tepida communi,ex qua fiat fotus.* Anodyne and repelling medicines ſhall be dropped into his eares, when it is exceedingly ſwoln, that the tumor may ſubſide,you ſhall caſt upon it the meal or floure of lentills,or vine leaves beaten with Gooſe greaſe.With all which remedies if the tumor doe not vaniſh, and withall you conjecture that there is *Pus* or matter contained therein,then you muſt open the *Dura Mater* with your inciſion knife,holding the point upwards & outwards, for ſo the matter will be poured forth and the ſubſtance of the brain not hurt nor touched.Many other Chirurgeons, and I my ſelf have done this in many patients with various ſucceſs. For it is better in deſperate cauſes to try a doubtfull remedy then none at all ; alſo it oft-times happens,whether by the violence of the contuſion and blow,or concretion or clotting of the blood which is ſhed, or the appulſe of the cold ayre,or the raſh application of medicines agreeing neither in temper nor complexion with the *Craſſa Meninx*,or alſo by the putrefaction of the proper ſubſtance,that the *Dura Mater* it ſelf becomes black. Of which ſymptome the Chirurgeon muſt have a great and ſpeciall care.

Remedies for the inflammation of the *Craſſa Meninx.*

How we muſt open the *Craſſa Meninx* when it is impoſtumate.

The cauſes and remedies of the blackneſs of the *Dura Mater.*

Therefore that thou mayſt take away the blackneſs, cauſed by the vehemency of the contuſion, you ſhall put upon it oyl of egges with a little *Aqua vitæ*, and a ſmall quantity of Saffron and Orris roots in fine powder;you ſhall alſo make a fomentation of diſcuſſing and aromatick things boyled in water and wine;and *Vigoes* Cerat formerly deſcribed ſhall be applyed. But if the harm come from congealed blood,you ſhall withſtand it with this following remedie. ℞ *Aqua vitæ ℥ij. granor. tinctorum in tenuem pulverem tritorum ℥ijß.croci,℈1. Mellis roſat.℥jß.ſarcocol. ʒiij. Leviter & ſimul bulliant omnia,& de colatura infundatur,quouſque nigrities fuerit obliterata.* If this affect come by the touch of the ayre,it ſhall be helped with this following remedy. ℞ *Tereb.ven.℥iij. Mellis roſ. ℥ij. Vitellum ovi unum*

Remedies for contuſion.

For congealed blood.

num farin.hordei ʒiij.*croci* ℈j.*sarcocol.* ʒij.*aq.vitæ* ʒij.*Incorporentur simul,& bulliant paululum.* This remedy shall be used untill the blackness be taken away,and the membrane recover its pristine colour. For the hurt received by the ayre.

But if this affect proceeds from the rash use of medicines, it must be helped by application of things contrary. For thus the offence caused by the too long use of moist and oyly medicines, may be amended by using catagmatick and cephalick powders; but the heat and biting of acrid medicines,shall be mitigated by the contrary use of gentle things; for both humid and acrid things somewhat long used make the part look black, that truly by generating and heaping up filth, but this by the burning and hardening heat.But when such blackness proceeds from putrefaction, *Iohn de Vigo* commends the following remedy. R *aquæ vitæ* ʒij.*mellis rosat.*ʒʃ. But if the affect be grown so contumacious that it will not yeeld to this gentle remedy,then this following will be convenient. R *Aq.vitæ* ʒiij.*mellis ros.*ʒj.*pulver. Mercur.* ʒij. *unica ebullitione bulliant simul ad usum dictum.* Or R *aquæ vit.*ʒiʃß.*syrup.absinth. & mellis ros.at.an.*ʒij. *unguenti ægyptiaci* ʒjʃß. *sarcocol.myrrhæ, aloes,an.* ʒj.*vini albi boni & odoriferi,*ʒj.*bulliant leviter omnia simul,colentur ad usum dictum.*But if the force of the putrefaction be so stubborn,that it will not yeeld to these remedies, it will be helped with *Ægyptiacum* (made with plantain water in stead of Vinegar) used alone by it self, or with the powder of Mercury alone by it self,or mixt with the powder of Alome. Neither must we be afraid to use such remedies especially in this extream disease of the *Dura Mater*; for in *Galens* opinion the *Crassa Meninx* after the skull is trepaned delights in medicines that are acrid,that is, strong and very drying, especially if it have no *Phlegmon*; and this for two reasons; the first is, for that hard and dry bodies, such as membranous bodies are,be not easily affected unless by strong medicines; the other is, which must be the chiefe and prime care of the Physitian,to preserve and restore the native temper of the part by things of like temper to it. But if the auditory passage not onely reaching to the hard membranes of the Brain,but also touching the Nerve which descends into it from the brain, suffer most vehement medicins,though it be placed so neer; certainly the *Crassa Meninx* will endure them far more easily and without harm. But if by these means the putrefaction be not restrained, and the tumor be encreased so much, that the *Dura Mater* rising far above the skull, remains unmoveable, black and dry,and the patients eyes look fiery, stand forth of his head and rowl up and down with unquietness and a phrensie,and these so many ill accidents be not fugitive,but constant; then know that death is at hand,both by reason of the corruption of the gangræn of a noble part, as also by extinction of the native heat.

What medicins make the *Crassa Meninx* black.

Medicins against that putrefaction of the *Meninx*.

VVhy the *Crassa Meninx* easily endures acrid medicins.

Signs of death at hand.

CHAP. XXII. *Of the cure of the Brain being shaken, or moved.*

WE have formerly declared the causes,signes and symptomes of the concussion, or shaking of the Brain,without any wound of the musculous skin, or fracture of the bone; wherefore for the present I will treat of the cure. Therefore in this case, for that there is fear that some vessell is broken under the skull,it is fit presently to open the cephalick vein.And let blood be plentifully taken according to the strength of the Patient,as also respectively to the disease both which is present,and like to ensue, taking the advice of a Physitian. Then when you have shaven away the haire,you shall apply to the whole head and often renue the forementioned cataplasme,*Ex farinis,oleo rosaceo,ex)melite,*and other like cold and moist repelling medicins. But you must eschew dry,and too astringent medicins must be shunned,such as are *Vnguentum de bolo* and the like;for they obstruct too vehemently,and hinder the passage forth of the vapours both by the sutures and the hidden pores of the skull.Wherefore they doe not only not hinder the inflammation, but fetch it when it is absent,or encrease it,when present. The belly shall be loosed with a clyster, and the acrid vapours drawne from the head; for which purpose also it will be good, to make frictions from above downwards, to make straight ligatures on the extream parts, to fasten large cupping-glasses with much flame to the shoulders and the originall of the spinall marrow,that so the revulsion of the blood running violently upwards to the brain,aud ready to cause a phlegmon, may be the greater.The following day it will be convenient to open the *Vena Puppis*,which is seated upon the Lambdall suture,by reason of the community it hath with the veins of the brain, & shutting the mouth and nose to strive powerfully to breath.For thus the membranes swell up, and the blood gathered between them and the skull is thrust forth; but not that which which is shut up in the brain and membranes,of which if there be any great quantity,the case is almost desperate,unless nature assisted with stronger force, cast it forth turned into *Pus*. But also after a few dayes the *vena frontis* or forehead vein may be opened,as also the Temporall Arteries and Veins under the tongue, that the conjunct matter may be drawn forth by so many open passages. In the mean space the Patient must keep a spare diet,and abstain from wine,especially untill the fourteenth day,for that untill that time the fearfull symptomes commonly reign. But repelling medicins must be used untill the fourteenth day be past,then we must come to discussing medicins, beginning with the more milde, such as is this following decoction.R *rad.Alth.*ʒvj.*irios,*℈*peri,calami arom.an.*ʒij.*fol.salviæ,majoran.betonic.flor.chamæm.melil.ros.sub.stœchad.an. M.*ʃ.*salis com.*ʒiij.*bulliant omnia simul secundum artem cum vino rub.& aqua fabrorum,fiat decoctio.*Let the head be washed therewith twice a day with a spunge. But yet when you do this,see that the head be not too much heated by such a fomentation,or any such like thing, for fear of pain and inflamation. Then you shall apply the cerate of *Vigo* which hath power to discusse indifferently,to dry, and draw forth the humors which are under the skull, and by its aromatick force and power to confirme and strengthen the brain; it is thus described. R *Furfuris bene triturat.*ʒiij.*farin.lentium*ʒij. *ros. myrtillor. foliorum & granorum ejus, an.* ʒj. *calam. aromat.*ʒjʃß.*chamæmelmelil.M.*ʃ.*nuces cupressi num.*vj.*olei rosacei,& chamæm.an.*ʒiij.*ceræ albæ* ʒiiʃß,*thuris,mastichis,an.*ʒiij.*myrrhæ* ʒij. *In pulverem quæ redigi debent redactis,& liquefactis oleis cum cera,omnia misceantur simul,& fiat mixtura,quæ erit inter formam emplastri & ceroti.*

The opening of the *Vena Puppis*.

A discussing fomentation.

A caution in fomenting the head.

A description of *Vigos* Cerate.

A History. *Vigo* saith, that one of the Duke of *Urbins* Gentlemen found the urine hereof to his great good. He fel from his horse with his head downwards upon hard Marble, he lay as if he had been dead, the blood gusht out of his nose, mouth and ears, and all his face was swollen and of a livid colour; he remained dumb twenty dayes, taking no meat but dissolved gellies, and Chicken and Capon broths with sugar; yet he recovered, but lost his memory, and faultered in his speech all his life after. To which purpose is that Aphorism in *Hippocrates*; Those which have their Brain shaken by what cause soever, must of necessity become dumb; yea also, as *Galen* observes in his Commentary, lose both their sense and motion. That Cerat is not of small efficacy, but of marvellous and admirable force, which could hinder the generating of an abscess, which was incident to the brain by reason of the fall. Yet there be many men so far from yeelding to reason, that they stifly deny, that any impostumation can be in the brain; and augmenting this errour with another, they deny that any who have a portion of the brain cut off can recover, or rise again; but the authority of ancient writers and experience do abundantly refell the vanity of the reasons whereon they rely. Now for the first, in the opinion of *Hippocrates*; If those which have great pain in their heads have either *pus*, water or blood flowing from their Nose, mouth or ears, it helps their disease.

Aph. 58. *sect.* 7.

That there may be an abscess in the brain. *Aph.* 10. *sect.* 6.

But *Galen*, *Rhasis*, and *Avicen* affirm that *Sanies* generated in the brain disburdens it self by the nose, mouth or ears; and I my self have observed many who had the like happen to them.

Gal. lib. de inequal. intemp. Rhas. dep. 4. cont. nent. Avicen. cap. de exit. sen. 3. lib. 4. cap. 20.

I was told by *Prothais Coulen*, Chirurgeon to *Monsieur de Langey*, that he saw a certain young man in the town of *Mans*, who often used to ring a great bell; he once hanging in sport upon the rope, was snatcht up therewith and fell with his head full upon the pavement: he lay mute, was deprived of his senses and understanding, & was besides hard bound in his belly. Wherefore presently a feaver and *delirium* with other horrid symptomes affayled him, for he was not trepaned because there appeared no sign of fracture in the skull: on the seaventh day he fell into a great sweat with often sneesing, by violence whereof a great quantity of matter and *Pus* flowed forth of his ears, mouth and nose, then he was eased of all his symptomes, and recovered his health.

A History.

Now for the second, *Galen* affirms that he saw a boy in *Smyrna* of *Ionia* that recovered of a great wound of the brain, but such an one as did not penetrate to any of the ventricles. But *Guido* of *Cauliac* saith, he saw one which lived and recovered after a great portion of the brain fell out by reason of a wound received on the hind part of his head. In the year of our Lord 1538. while I was Chirurgeon to the Marshall of *Montejan* at *Turin*, I had one of his Pages in cure, who playing at quoits received a wound with a stone upon the right *Bregma* with a fracture, and so great an Effracture of the bone, that the quantity of half a hasell Nut of the brain came forth thereat. Which I observing, presently pronounced the wound to be deadly; a Physitian which was present contradicted my opinion, affirming that substance was no portion of the brain, but a certain fatty body. But I with reason and experience in presence of a great company of Gentlemen, convinced the pertinacy of the Man, with reason; for that fat cannot be generated under the skull, for although the parts there contained be cold, yet because they are heated by the abundance of the most hot and subtle animall spirits, and the heat of vapours rising thither from all the body, they do not suffer fat to concreat about them. But with experience, for that in the dissecting of dead bodies, there was never any fat observed there; besides also fat will swim on the top of water; but this substance as marrowy, cast into the water presently sunk to the bottome.

Lib. 8. de usu part. & com. ad aph. 18. sect. 6.

Why fat cannot be generated under the skull.

Lastly, fat put to the fire becomes liquid and melts; but this substance being laid upon a hot iron, became dry, shrunk up and contracted it self like a peece of leather; but dissolved not at all. Wherefore all those which were present cryed out, that my judgment was right of that substance that came forth of the skull. Yet though it was cut away, the Page recovered perfectly, but that he continued deaf all his life after.

Signs of a fatty substance.

CHAP. XXIII. *Of the wounds of the face.*

WHy we treat in particular of wounds of the face.

HAving treated of the wounds of the head by their causes, signs and cure, it follows that we now speak of the wounds of the face, if but for this, that when they are carelesly handled, they leave deformed scars in the most specious and beautifull part of the body. The causes are the same which are incident to the skull, that is, externall. But this may be added to the kinds and differences of the wounds, that the life may be out of danger though any one whole part of the face, (as the ear, eye, nose, lip) may be cut away by a wound, but not so in the head or skull. Wherefore beginning at the wounds of the eye-brows, we will prosecute in order the wounds of the other parts of the face.

A thing to be observed in wounds of the eye-brows.

This is chiefly to be observed in wounds of the eye-brows, that they are oft-times cut so overthwart, that the muscles, and fleshy pannicle which move and lift them up, are wholly rent and torn. In which case the eye-lids cannot be opened, and the eyes remain covered, and as it were shut up in the cases of their lids; so that even after the agglutination of the wound, if the Patient would look upon any thing, he is fore'd to hold up the eye-lids with his hand; with which infirmity I have seen many troubled, yet oft-times not so much by the violence of the wound, as by the unskilfulness of the Chirurgeon who cured them; that is, by the negligent application of the bousters, an unfit ligature and more unfit suture. In this case the skilfull Chirurgeon which is called to the Patient shall cut off as much of the skin and fleshy pannicle as shall serve the eye-lids, that so they may by their own strength hold and keep open, without the help of the hand: then he shall sow the wound as is fit, with such a stitch as the Furriers, and Glovers use; and then he shall pour thereon some of the balsome of my description, and shall lay such a medicine to the neighbouring parts. R. *Olei ro-*

sar.

far. ℥ ß, *album.ovor.nu.* ij. *boli armeni, sanguinis Dracon. Mastich. an.* ℥ j. *agitentur simul, fiat medicamentum.* Then let the part be bound with a fitting Ligature. Afterwards you shall use *Emplast. de gratia Dei, Empl. de Betonica, Diacalcitheos,* or some other like, untill the wound be cicatrized. But such like and all other wounds of the face may be easily healed, unless they either be associated with some malign symptomes, or the Patients body be repleat with ill humors.

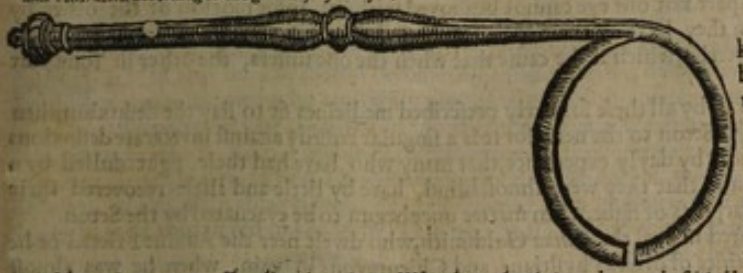
There sometimes happens a quite contrary accident in wounds of the eye-brows, that is, when the eye-lids stand so up that the Patient is forc'd to sleep with eyes open, wherefore those which are so affected are called by the Greeks *Lagophthalmi*. The cause of this affect is often internall, as a carbuncle or other kind of abscess, as a blow or stroak. It shall be cured by a crooked or semicircular incision made above the eye-lids, but so that the extreams of the semicircle bend downwards, that they may be pressed down and joyned as much as is needfull to amend the stifness of the eye-lid. But you must not violate the gristle with your Instrument, for so they could no more be lifted up; the residue of the cure must be performed as is fit.

Lagophthalmia is a quite contrary to the falling down of the eye-lids.

CHAP. XXIIII. *Of the wounds of the eyes.*

WOunds of the eyes are made by the violence of things pricking, cutting, bruising, or otherwise loosing the continuity. But the cure must alwayes be varied according to the variety of the causes and differences. The first head of the cure is, that if any strange and heterogeneous body shall be fallen into the eyes, let it be taken forth as soon as you can, lifting and turning up the eyelid with the end of a *spatula*. But if you cannot discern this moat or little body, then put three or four seeds of *Clary*, or *Oculus Christi* into the pained eye. For these seeds are thought to have a faculty to cleanse the eyes and take out the moats, which are not fastened deep in, nor do too stubbornly adhere to the membranes. For in this case, you shall use this following instrument, for herewith we open the eye-lids the further, putting it between them and the eye, and also keeping the eye steddy by gently pressing it, that so with our mullets we may pull out the extraneous body; this is the figure of such an Instrument.

The delineation of a Speculum oculi, fit to dilate and hold asunder the eye-lids, and keep the eye steddy, it is so made, that it may be dilated and contracted according to the greatness of the eyes.



All strange bodies taken out, let this medicine be put into the eye. Take the strains of a dozen egs, let them be beaten in a leaden Mortar, with a little Rose water; and so put into the eye; but let this repercussive be laid upon the eye and the neighbouring parts. ℞. *albumin.ovor.nu.* iiij. *pulver. aluminis rochæ combusti* ℥ ij. *sanguinis Draconis* ℥ j. *aquæ rosar. & plantag. an.* ℥ ij. *agitentur simul,* make a repercussive, which you may frequently use. Or else apply cheese curds well wrung, mixed with rosewater, the white of an egge, and as much *acacia* as shall suffice. This which followeth doth more powerfully stay the flowing humor. ℞ *gum arab. & tragac. an.* ℥ ij. *psilii. cydon. semin. portul. plant. sumach. an.* ℥ ij. *fiat mucag. cum aqua plantag. solan. & rosar. concinnetur collyrium,* of which you may drop some both within and about the eye.

A repercussive to be put into the eye.

Divers repercussives to be applyed to the eye.

But note, that all such remedies must be applyed warm, both that they may the better penetrate by their moderate heat, as also for that all actuall cold things are hurtfull to the eyes and sight, because they dull the sight by incrustating the vitive spirits. For I have known many who have become dull of sight by the frequent using of medicines actually cold to the eyes. I have on the contrary seen not a few, who have recovered with the fit use of such like medicines, who have had any part of their eye (so it were not the *pupilla* or apple of the eye) so pricked with a needle or bodkin, that much of the waterish humor ran forth thereat.

Things actually cold are hurtfull to the eyes.

The milk of a woman which suckles a girl (for that is reputed the cooler) mitigates pain and clenses, if it be milked out of the Dug into the ey; to which purpose also the blood of Turtles, Pigeons or Chickens much conduces; being dropt into the eye by opening a vein under their wings. Also this following cataplasm affwageth pain and inflammation, and hinders defluxion, being applyed to the eye and the adjacent parts. ℞. *Carnis pomorum sub cinere calido decoctorum* ℥ v. *vitellos ovorum num.* iij. *cassiæ fistulæ recenter extractæ* ℥ ß, *mucaginis psilii, altheæ & cydon. an.* ℥ j. *farin. hordei parum, incorporentur omnia simul, fiat cataplasma.* Also sheeps lungs boyled in milk and applyed warm, and changed as they grow cold, are good to affwage pain. But if the too violent heat and pain, shall not yeeld to such medicines, but require more vehement, then *Foliorum Hyoscyami, m.j. sub. cineribus coquatur, atque in mortario cum mucagine seminis psilii, & cydoniorum extract. in aquis solani & plantag. pisletur:* then let this medicine be wrapped in a linnen cloth and applyed to the eyes and temples. The mucilages of *Psilium*, or Fleawort, and Quince seeds extracted in a decoction of Poppy heads and mixed with a little *Opium* and Rose water, are used for the same purpose. But when there is need of detergent and sarcotick medicines, then ℞, *syrup. rosar. siccor.* ℥ j. *aq. fenic. & rutæ an.* ℥ ij. *aloes lotæ, olibani an.* ℥ ß. mix them for the foresaid use. The galls of Scates, Hares, and Partridges dissolved in Eye-bright, and Fennill water, are fit for clensing such wounds; as also this following *Collyrium.* ℞ *Aquæ hordei* ℥ j. *mellis despumati,* ℥ iij. *aloes ter lotæ in aqua plantaginis & sacchari cand. an.* ℥ j, *fiat collyrium.* Also this insuing medicine is very sarcotick. ℞. *mucagin. gummi olibani, arabici, tragacanth. & sarcocol. in aq. hordei extract. an.* ℥ iij.

Anodyne medicines for the eyes.

Narcoticks.

Detergent medicines.

A sarcotick medicine for the eyes.

aloes ter lotæ in aq. rosarum. ℥ j. *ceruss. ustæ & lotæ, tutiæ præpar. an.* ℥ ß. *fiat collyrium.* But here you must note, that the coat *Adnata* often swells so much by reason of a wound or some other injury, and stands so forth by the falling down of humors, access and mixture of flatulencies, that it hides the whole *Pupilla*, and hangs forth of the eye-lids, like as if it were an unnaturall fleshy excrescence, and it looses the native colour, and looks very red; so that the eye can neither be shut nor opened.

Wherewith a young Chirurgeon being deceived, determined to cut away this protuberancy of the *Adnata*, as though it had been some superfluous flesh, and then to wash it with cathæretick powders, had I not forbidden him, telling him of the certain danger of blindness which would thereupon befall the Patient. Wherefore I prescribed a fomentation of chamomile, melilote, Rose leaves, wormwood, rue, fennill, and aniseeds boyled in milk with the roots of Orris and Marigolds. Then I presently added this following fomentation, being more powerfull and drying. ℞ *Nucis cupressi, gallar. balaust. an.* ℥ j. *plantag. absinth. hippuris, flo. chamæm. ros. rub. an. M.* ß. *bullant simul cum aqua fabrorum, & fiat decoctum pro fotu cum spongia.* Besides also you may apply a cataplasm made of barly and bean flowre, the powders of Mastick, Myrrhe, and Aloes, and some of the last described decoction. The tumor beginning to decline, I dropt the flowing liquor into the eye, which hath a very astringent, drying and strengthening faculty. Roast a new laid egge in Embers untill it be hard, then pill off the shel, take forth the yolk, and in place thereof put a scruple of Roman Vitrioll in fine powder, then put it in a linnen cloth and wring it hard forth into some clean thing, and drop thereof for some dayes into the eye, with a little Smiths water wherein Sumach and Rose leaves have been boyled. I have found by experience the certain force of this remedy; but if notwithstanding there be a true fleshy excrescence upon the coat *Adnata*, it may be taken away by this following powder. ℞ *Ossis sepiæ, & testæ ovorum calcinatæ an* ℥ j. *fiat pulvis.* Calcined Vitriol, burnt Alum and the like may be commodiously used to this purpose. Yet you must warily make use of all such things, and alwayes lay repercussives about the eye, that no harm insue thereof. For divers times acrid humors fall down into the eye with such violence, that they break the Horny coat, whereupon the humors of the eye are poured out. Remember also, that in diseases of the eyes, the Patient lye with his head somewhat high, and that he keep shut not only the pained, but also the sound eye, because rest is alwayes necessary for the grieved part. But one eye cannot be moved without some motion of the other by reason of the connexion they have by their optick and moving nerves, both the *Meninges* and the *Pericranium*, Veins and arteries; which is the cause that when the one suffers, the other in some sort partakes therewith.

A drying fomentation.

A medicine to consume a fleshy excrescence without biting.

But if we cannot prevail by all these formerly prescribed medicines fit to stay the defluxion, then it remains, that we apply a Seton to the neck; for it is a singular remedy against inveterate defluxions into the eyes. For we know by dayly experience, that many who have had their sight dulled by a long and great defluxion, so that they were almost blind, have by little and little recovered their former splendour and sharpness of sight, when matter once begun to be evacuated by the Seton.

A Seton, a good remedy against invererate defluxions into the eyes.

The truth hereof appeared in *Paul* the *Italian* Goldsmith, who dwelt neer the Austine Friers. For he having used many medicines of divers Physitians, and Chirurgeons in vain, when he was almost blind, he applying a Seton, by mine advice, began by little and little to see better according to the quantity of the matter which was evacuated, untill at length he perfectly recovered his sight. But at last growing weary of the Seton which he had worn for a year (although matter came dayly forth thereof) yet he would have it taken forth, and healed up; but this way of evacuation being shut up, and the humor again beginning to flow into his eyes, so that he was in danger to become blind, he called me and made me again to apply the Seton in his neck. Whereby recovering his former soundness and perfection of sight, he yet wears the Seton.

A History.

A Seton good against the falling sickness.

I also once freed by this kind of remedy, by the appointment of the most learned Physitian *Hollerius*, a certain young man of twenty years old, from the falling sickness, who before had many fits thereof; the Ichorous humors, the feeders of this disease, being by this means, as it is most probable, drawn away and evacuated.

A figure of the Pincers, actuall Cautery and Needle used in making a Seton.

The manner of making a Seton.

Wherefore seeing a Seton is of this use, I have thought good in this place to set down in writing and by figure, the manner of making thereof, for the behoof of young practitioners: wish the Patient to sit on a low stool, and to bend down his head, that so the skin and fleshy pannicle may be relaxed; then must you with your fingers pluck up and sever the skin from the muscles, and take hold of as much hereof as you can with your pincers, not touching the muscles of the neck for fear of a convulsion and other symptomes; you shall then twitch the skin which is held in the pincers, most hard, when you shall thrust the hot Iron

through

through the holes made in the midſt of them; that alſo the nerves being ſo twitched, the dolorifick ſenſe may the leſs come to the part. The wound muſt be made or burnt in long wayes, and not twharting, that ſo the matters may be the better evacuated by the ſtrait fibers. But the cautery or hot Iron muſt have a three or elſe a four-ſquare point & that ſharp, that ſo it may the more eaſily and ſpeedily enter. Then keeping the pincers immoveable, let him draw through the paſſage made by the cautery a needle thred with a three or four doubled thred of Cotton [or rather a skean of ſilk] moiſtened in the white of an egge and oyl of Roſes; then after you have applyed pledgets dipped in the ſame medicine, bind up the part with a convenient ligature. The day following the neck muſt be anointed with oyl of Roſes, and the pledgets dipped in the former medicine applyed for ſome dayes after. But it will be convenient to moiſten the Seton with a digeſtive made of the yolk of an Egge and oyl of Roſes, untill the ulcer caſt forth much matter; then you ſhall anoint the Cotton thred with this following remedy. ℞ *terebinthinæ ven.* ℥ iiij. *ſyrupi roſat. & abſinthii an.* ℥ ß. *pulveris Ireos, diacrydii, agarici trochiſcati, & Rhei, an.* ℥ ß. *incorporentur omnia ſimul & fiat medicamentum.* Which you ſhall uſe ſo long, as you intend to keep open the ulcer. For it hath a faculty to draw the humors from the face, and cleanſe without biting.

I have found not long ſince by experience, that the apertion made with a long thick Triangular needle of a good length like to a large pack-needle, is leſs painfull than that which is performed with the actuall cautery, which I formerly mentioned. Wherefore I would advice the young Chirurgeon, that he no more uſe the foreſaid actuall cautery. I have here given you the figure of the needle.

The Figure of a Triangular Needle.

CHAP. XXV. *Of Wounds of the Cheek.*

SEeing a wound of the cheek ſeems to require a ſuture (as they term it) leſt that the ſcar ſhould become deformed. For that deformity is very grievous to many, as to women who are highly pleaſed with their beauties. Therefore you ſhall ſpread two peeces of new cloath of an indifferent fineneſs, and proportionable bigneſs with this inſuing medicine. ℞. *pulveris maſtichini, ſanguinis Draconis, thuris, farinæ volatilis, tragacanthæ contuſæ, gypſi, picis, ſarcocollæ an.* ℥ ij. *picis nigræ* ℥ i ß. *albuminis ovorum quæ ſufficiant, fiat medicamentum.* Apply the peeces of cloth ſpread with this on each ſide of the wound one, ſome fingers breadth aſunder, and let it alone till it be hard dryed to the skin. Then you ſhall ſo draw them together with your needle and thred, that the fleſh by their ſticking may alſo follow, and be mutually adjoined, as you may ſee it here expreſt. The wound ſhall be agglutinated by this means, together with the uſe of fit medicines, pledgets, ligatures. But all the ligatures and ſtayes which ſhall be uſed for that purpoſe muſt be faſtened to the Patients night-lap.

The uſe of a dry ſuture.

How to make a dry ſuture.

But when the wound is great and deep, and the lips thereof are much diſtant the one from the other, there can be no uſe of ſuch a dry ſuture. Wherefore you muſt uſe a three or four ſquare needle (that ſo it may the more readily and eaſily enter into the fleſh) being thred with a waxed thred; and with this you muſt thruſt through the lips of the wound, and leave the needle ſticking in the wound, & then wrap the thred to and again over the ends thereof eight or ten times, juſt after that manner which women uſe to faſten a needle with thred in it, upon their ſleeves, or Tailors to their hats or caps, that they may not loſe them.

A Suture fit for hare-lips.

The manner thereof

The needle thus faſtened, ſhall be there untill the perfect agglutination of the wound; this kind of ſuture is uſed in the wounds of the lips, as alſo in hare-lips, for ſo we commonly call lips which are cleft from the firſt conformation in the wombe by the error of the forming faculty. But ſuch a ſuture will help nothing to agglutination, if there lye or remain any skin between the lips of the wound

What hare-lips are.

wound; Wherefore you shall cut away whatsoever thereof shall be there, otherwise you must expect no union. Other kind of sutures are of no great use in wounds of these parts, for out of the necessity of eating and speaking, they are in perpetuall motion; wherefore a third would cut the flesh; for which reason you shall take up much flesh with such Needles mentioned in this last described kind of Suture as this following figure shewes.

The figure of the future fit for cloven or hare lips: as also the dilineation of the Needle about whose ends the thred is wrapped over and under, to and again.

A History.

A decoction good to wash away putrefaction.

A small hole remaining after the cure of great wounds.

To this purpose I will recite a history, to the end, that if any such thing happen to come to your hands, you may do the like. A certain Gascoin in the battell at Saint *Laurence* had his upper jaw cut overthwart even to his mouth, to the great disfiguring of his face. The wound had many wormes in it and stank exceedingly, because he could get no Chirurgeon untill three dayes after he was hurt. Wherefore I washed it with a decoction of wormwood, Aloes, and a little *Ægyptiacum*, both to kill the wormes, and to fetch away all the putrid matter; I discussed the tumor with a dissolving fomentation and cataplasm, I joyned together the lips of the wound with the last described future. But I applyed this following medicine to the whole part. R *Terebinth. venet. ℥vj. gummi elemi. ℥ij. pulveris boli armeni, san. drac. Masticches, myrrhæ, aloes, an. ℥ß. incorporentur simul. fiat medicamentum.* The wound was agglutinated within a few dayes, but that there remained a certain little hole at the joyning of the lower jaw with the upper, wherein you could scarse put the head of the pin; out whereof nevertheless much serous and thin moysture flowed, especially when he either eat or spake; which I have also observed in many others. But for staying of this watrish humidity I dropped *Aqua fortis* into the bottome of the ulcer, and divers times put therein a little of the powder of burnt vitriol. Thus by Gods grace he recovered and became whole.

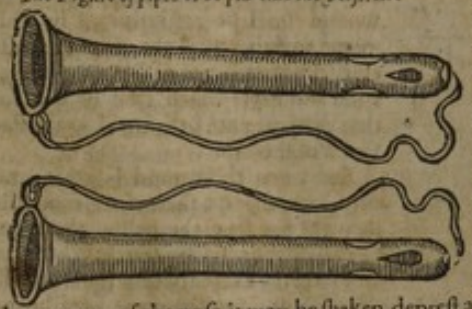
CHAp. XXVI. *Of the wounds of the Nose.*

How many wayes the nose may be hurt.

THe Nose many wayes suffers solution of continuity; as by a wound, fracture and contusion, and it is sometimes battered & broken on the upper part; which when it happens, you shall restore the depresst bones to their native seat and figure, with the end of a *spatula* or fit stick wrapped about with towe, cotton or a linnen rag. Then with pledgets dipped in an astringent medicine composed *ex albumine ovi, mastich. bolo armeno, sanguin. drac. & Alumine usto*, and applyed to the side of the nose, he shall labour to strengthen the restored bones, and then bind them with a convenient ligature, which may not presse them too much, lest the nose should become flat, as it happens to many through the unskilfulness of Chirurgeons.

The cure of a broken nose.

The Figure of pipes to be put into the Nostrils.



The use of pipes in broken noses.

Then must you put little pipes into the nostrills, and these not exactly round, but somewhat flat and depresst, tyed to the night-cap on each side with a thred, lest they should fall out. By the help of these pipes the bones of the nose will be kept in their place, and there will be passage forth for the matter, and for inspiration and exspiration. But if all the nose, or some portion thereof shall be wholly cut off, we must not hope to restore it. But if the Nose be so cut, that as yet it adheres to much of the adjacent flesh, from whence it may receive life and nourishment, then sow it up. For the lower part of the nose it may be shaken, depresst and wrested aside, seeing it is gristly; but it cannot be broken as the other which is of a bony nature.

CHAP. XXVII. *Of the Wounds of the Tongue.*

How many wayes the continuity of the tongue may be loosed.

THe tongue may be so wounded, that either it may be wholly cut off and deprived of some portion of the substance, or only slit long wayes or athwart. The losse of the substance cannot be repaired, because every part separated and pluckt from the living body, from whence it had life, spirit and blood, presently dyes. For as the Philosophers say, *A privatione ad habitum non est regressus.* But when it is cut or slit longwayes or sideways, it is easily restored by future, if so be that the cloven part yet adhere to the living body from whence it may draw both matter and form of life. Therefore a carefull servant shall straitly hold with a soft and clean linnen cloth the body of the tongue, lest it should slip away by reason of its slipperiness, whilst the Chirurgeon stitch it above and below; when he thinks he hath sufficiently sowed it, let him cut off the thred as neer to the knot as he can, lest being left too long it might be tangled with the teeth as he eats, and so cause a hurtfull laceration or rending of the sowed parts. In the mean time let the patient eat barly creams, almond milks, Gellyes, cullisses and broths, and the yolks of egs; and let him often hold in his mouth Sugar of Roses and syrup of Quinces; for such things besides their nourishing

The cure of a cloven tongue.

faculty, perform the part of an agglutinating and detergent medicine. I have learned these things I have here set down, neither from my masters whom I have heard with attention, nor by reading

of

of books,but they have been such as I have tryed with happy success in many; as in the son of Monsieur *de Marigny* President of the Inquisition,in *John Piet* a Carpenter dwelling in the suburbs of Saint *German*.

But most apparently in a child of three years old,the son of the great Lawyer Monsieur *Covet*,who fell with his chin upon a stone,and so cut off a large peece of the end of his tongue, which chanced to be between his teeth,it hung but at a very small fiber of flesh,so that I had very little or no hope to agglutinate and unite it,which thing almost made me to pluck it quite away; yet I changed that determination by considering the loss of the most noble action of speaking, which would thereupon ensue,and weighing the providence of nature often working wonders and such things as exceed the expectation of the Physitian in curing diseases. I also thought thus with my self, the flesh of the tongue is soft,loose,fungous and spungy,neither is it altogether obvious to the externall injuries of the ayr; wherefore after that I had once or twice thrust through the needle and thred upwards and downwards,and for the rest ordered the child to be used and dieted after the manner I lately mentioned,he grew well within a short time,and yet remains so,speaking well and distinctly.

A History. Nature oft doth strange things in the cures of diseases.

CHAP. XXVIII. *Of the Wounds of the Eares.*

THe eares are sometimes wholly cut off, sometimes but in part, otherwhiles they are only slit,so that the rent portion as yet adhering to the rest, is joyned with it in communion of life. In this last case it is fit to use a suture; but yet so that you touch not the gristle with your needle;for thence there would be in danger of a gangræne which happens to many by foolish curing; therefore you shall take up and comprehend with your needle only the skin,and that little flesh which encompasses the gristle. You shall perform the rest of the cure with pledgets and ligatures artificially fitted,and shall resist inflammation and other symptomes with fit medicins. But you must take speciall care that no superfluous flesh grow in the auditory passage, which may hinder the hearing; wherefore you shall keep that passage free by stopping it with a peece of spunge. But you shall procure agglutination and consolidation of the gristly part (and therefore next to a bone most dry) with dry medicins. But those who have their ears quite cut off, can do nothing but hide the deformity of their mis-hap with a cap,stuffed with cotton on that side.

How many wayes the unity of ears may be violated. How to sow a wounded Eare.

CHAP. XXIX. *Of the Wounds of the neck and throat.*

THe Wounds of the neck and throat are somewhiles simple, as those which only use the continuity of the muscles;otherwhiles compound, such as those which have conjoyned with them a fracture of the bones, as of the *Vertebræ*,or hurt of the internall and externall jugular Veins,or sleepy Arteries;sometimes the *Trachea Arteria*, or Weazon, and the *œsophagus* or gullet are wounded;sometimes wholly cut off,whence present death ensues. Wherefore let not the Chirurgeon meddle with such wounds, unless he first foretell the danger of death, or the loss of some motion to those that are present. For it often happens that some notable nerve or tendon is violated by a wound in the neck,whence a palsie ensues, and that absolutely incurable, if the wound shall penetrate to the spinall marrow, also hurt therewith. Wounds of the gullet and Weazon are difficultly cured because they are in perpetuall motion; and chiefly of the latter by reason it is gristly and without blood. The wounds of the gullet are known, by spitting of blood,by the breaking forth of meat & drink by the wound;but if the gullet be quite cut asunder,the patient cannot swallow at all. For the cut parts are both contracted in themselves, the one upwards, and the other downwards. But we know the weazon is hurt, by casting up blood at the mouth with a continuall cough, and by the coming forth of the breath or winde by the Wound. The Wounds of the jugular Veins and sleepy Arteries,if they be great, are usually deadly, because they cannot be straitly bound up;for you cannot bind the throat hard without danger of choaking or strangling the patient. But for defect of a strait ligature in this case the flux of blood proves deadly. If the recurrent Nerve of either side be cut,it makes the voice hoarse;if cut on both sides,it takes away the use of speech,by hurting these instruments which impart motion to the muscles of the *Larinx*. For the cure if the wound be small, and not associated with the hurt of any notable vessel, nor of the Weazon and gullet,it is speedily and easily cured; and if there shall be need you shall use a suture, then you shall put therein a sufficient quantity of Venice Turpentine mixed with bole-Armenick; or else some of my Balsam of which this is the receipt. ℞ *Terebinth. venetæ* ℔ß *ff. gum. elemi* ℥iiij. *olei hypericonis* ℥iij. *boli armeni,& sang. draconis an.* ℥j. *aquæ vitæ* ℥ij. *liquefiant simul omnia lento igne,& fiat Balsamum ut artis est,addendo pulveris ireos florent. aloes,Mastiches,myrrhæ an.* ℥j. I have done wonders with this Balsame in the agglutination of simple wounds,wherein no strange body hath been. Now when you have put it in,lay upon it a plaister of *Diacalcitheos* dissolved in oyl of Roses & vinegar,as that which hath power to repress the flowing down of humors, and hinder inflammation, or in stead thereof you may apply *Emp. de Gratia Dei*, or *Emp. de Ianua*. But if the jugular veins and sleepy Arteries be cut,let the bleeding be stayed,as we have shewed in a chapter,treating thereof. When the Weazon or Gullet are wounded,the Chirurgeon shall sow them up as neatly as he can;and the Patient shall not endeavour to swallow any hard thing,but be content to be fed with gellyes and broths. When a gargarisme is needfull,this following is very good. ℞ *hordei M.j. florum rosar. p.j. passul. mund. jujubarum an.* ℥ß. *glycyrhizæ* ℥j. *bulliant omnia simul,addendo mellis ros.& Julep. ros. an.* ℥ij. *fiat gargarisma, ut artis est.*

With which being warm the Patient shall moysten his mouth,and throat,for it will mitigate the harshness of the part,assuage pain,cleanse and agglutinate, and make him breath more freely. But that the Chirurgeon may not despaire of, or leave any thing unattempted in such like wounds, I have thought good to demonstrate by some examples how wonderfull the works of nature are, if they be assisted by Art.

The differences of wounds of the neck & throat. The palsie followes upon wounds of the neck. Signes that the gullet is wounded. The wounds of the jugular veins and sleepy Arteries are deadly by accident. By hurting the recurrent Nerve the voice is hurt. The description of the Authors Balsam. The faculty of *Diacalcitheos*. The cure of the wounded Weazon and gullet. A gargarism. The manifold use thereof.

A Hiſtory. A certain ſervant of Monſieur *de Champaigne*, a gentleman of *Anjou*, was wounded in the throat with a ſword, whereby one of the jugular veins was cut together with his Weazon. He bled much and could not ſpeak, and theſe ſymptomes remained, untill ſuch time as the wound was ſowed up, and covered with medicines. But if the medicins at any time were more liquid, he as it were ſucked them by the wound and ſpaces between the ſtitches, and preſently put forth at his mouth that which he had ſucked or drawn in. Wherefore more exactly conſidering with my ſelf, the greatneſs of the Wound, the ſpermatick, and therefore dry and bloodleſs nature unapt to agglutination, of the affected part, but chiefly of the Weazon and jugular vein; as alſo for that the rough Artery is obnoxious to theſe motions which the gullet performs in ſwallowing, by reaſon of the inner coat, which is continued to the coat of the gullet, by which means theſe parts mutually ſerve each other with a reciprocall motion, even as the ropes which run to the wheel of a pulley; furthermore weighing that the Artery was neceſſary for the breathing, and tempering the heat of the heart, as the jugular veins ſerved for the nouriſhment of the upper parts; and laſtly weighing with my ſelf the great quantity of blood he had loſt, which is as it were the treaſure of nature, I told thoſe which were preſent, that death was neer and certainly at hand. And yet beyond expectation, rather by divine favour then our Art, he recovered his health.

A ſtrange Hiſtory. Equally admirable is this hiſtory following, Two Engliſhmen walked out of the City of *Paris* for their recreation to the wood of *Vincenne*; but one of them lying in wait to rob the other of his money and a maſſie chain of gold which he wore ſet upon him at unawares, cut his throat and robbed him, and ſo left him amongſt the Vines which were in the way, ſuppoſing he had kill'd him, having with his dagger cut the Weazon and gullet. This murderer came back to the city; the other half dead, crawled with much adoe to a certain Peaſants houſe, and being dreſſed with ſuch medicines as were preſent and at hand, he was brought to the City, and by his acquaintance committed to my cure to be cured. I at the firſt, as diligently as I could, ſowed up the Weazon which was cut quite aſunder, and put the lips of the wound as cloſe together as I could; I could not get hold of the gullet becauſe it was fallen down into the ſtomach, then I bound up the wound with medicins, pledgets and fit ligatures. After he was thus dreſt he begun to ſpeak, and tell the name of the villain the author of this fact, ſo that he was taken and faſtened to the wheel, and having his limbs broken loſt his wretched life, for the life of the innocent wounded man who dyed the fourth day after he was hurt.

Another Hiſtory. The like hurt befell a certain Germane, who lay at the houſe of one *Perets* in the ſtreet of Nuts; he being frantick, in the night cut his throat with a ſword: I being called in the morning by his friends who went to ſee him, dreſt him juſt after the ſame manner as I dreſſed the Engliſhman. Wherefore he preſently recovered his ſpeech, which before could not utter one ſyllable, freed from ſuſpition of the crime and priſon the ſervant, who lying in the ſame chamber with him, was upon ſuſpition committed to priſon, and confeſſing the thing as it was done, lived foure dayes after the wound being nouriſhed with broths put into his fundament like clyſters, and with the gratefull vapour of comfortable things, as bread newly drawn out of the Oven and ſoaked in ſtrong wine. Having thus by Art of Chirurgery made the dumb ſpeak for the ſpace of foure dayes.

CHAP. XXX. *Of the Wounds of the Cheſt.*

The differences of wounds of the Cheſt. SOme wounds of the Cheſt are on the fore ſide, ſome behind, ſome penetrate more deep, others enter not into the capacity thereof, other ſome pierce even to the parts contained therein, as the *Mediaſtinum*, Lungs, heart, midriffe, hollow vein, and aſcendent artery; Other ſome paſſe quite through the body; whereby it happens that ſome are deadly, ſome not.

The ſignes. You ſhall thus know that the wound penetrates into the capacity of the Cheſt, if that when the patients mouth and noſe be ſhut, the breath, or wind breaks through the wound with noiſe, ſo that it may diſſipate, or blow out a lighted candle being held neer it. If the patient can ſcarſe either draw, or put forth his breath, which alſo is a ſigne that there is ſome blood fallen down upon the *Diaphragma*.

Signes that the heart is wounded. By theſe ſignes you may know that the heart is wounded: If a great quantity of blood guſh out, if a trembling poſſeſſe all the members of the body; if the pulſe be little and faint, if the colour become pale, if a cold ſweat and frequent ſowning aſſail him, and the extream parts become cold, then death's at hand.

A Hiſtory. Yet when I was at *Turin* I ſaw a certain Gentleman who fighting a duell with another, received a wound under his left breſt which pierced into the ſubſtance of his heart, yet for all that he ſtruck ſome blowes afterwards, and followed his flying enemy ſome two hundred paces untill he fell down dead upon the ground; having opened his body, I found a wound in the ſubſtance of the heart, ſo large as would contain ones finger; there was only much blood poured forth upon the midriffe.

Signes that the Lungs are wounded. Theſe are the ſignes that the Lungs are wounded, for the blood comes foamy or frothy out of the wounds, the Patient is troubled with a cough, he is alſo troubled with a great difficulty of breathing and a pain in his ſide, which he formerly had not; he lyes moſt at eaſe when he lyes upon the wound, and ſometimes it comes ſo to paſs, that lying ſo he ſpeaks more freely and eaſily, but turned on the contrary ſide, he preſently cannot ſpeak.

Signes that the midriffe is wounded. When the *Diaphragma*, or midriffe is wounded, the party affected is troubled with a weight or heavineſs in that place, he is taken with a *Delirium*, or raving by reaſon of the ſympathy of the Nerves of the ſixth conjugation which are ſpread over the midriffe; difficulty of breathing, a cough & ſharp pain troubles the patient, the Guts are drawn upwards; ſo that it ſometimes happens by the vehe-

vehemency of breathing, that the ſtomach and guts are drawn through the wound into the capacity of the Cheſt; which thing I obſerved in two.

The one of theſe was a Maſon, who was thruſt through the midſt of the midriffe, where it is nervous, and dyed the third day following. I opening his lower belly, and not finding his ſtomach, thought it a monſtrous thing; but at length ſearching diligently, I found it was drawn into the Cheſt, through the wound which was ſcarſe an inch broad. But the ſtomach was full of wind, but little humidity in it. A Hiſtory.

The other was called captain *Francis d'Alon* a Native of *Xantoigne*, who before *Rochell* was ſhot with a Muſket Bullet, entring by the breaſt-bone neer to the ſword-like Griſtle, and paſſing through the fleſhy part of the midriffe, went out at the ſpace between the fifth and ſixth baſtard ribs. The wound was healed up on the out ſide, yet for all that there remained a weakneſs of the ſtomach, whereupon a pain of the guts like to the colick took him, eſpecially in the Evening, and on the night; for which cauſe he durſt not ſup but very ſparingly. But on the eighth month after, the pain raging more violently in his belly then it was accuſtomed, he dyed; though for the mitigating of the vehemency thereof *Simon Mahmedy* and *Anthony du Val* both learned Phyſitians omitted no kind of remedy. The body of the diſeaſed was opened by the skilfull Chirurgeon *James Guillemeau*, who found a great portion of the colick gut ſwelled with much wind gotten into the Cheſt, through the wound of the *Diaphragma*, for all it was ſo ſmall that you could ſcarſe put your little finger in thereat. But now let us return from whence we digreſſed. Another Hiſtory.

We underſtand that there is blood poured forth into the capacity of the Cheſt by the difficulty of breathing, the vehemency of the increaſing feaver, the ſtinking of the breath, the caſting up of blood at the mouth, and other ſymptomes which uſually happen to theſe who have putrefied and clotted blood poured out of the veſſels into the belly, infecting with the filthy vapour of the corrupt ſubſtance, the parts to which it ſhall come. But alſo, unleſs the Patient cannot lye upon his back, he is troubled with a deſire to vomit, and covets now and then to riſe, whence he often falls into a ſwound, the vitall faculty which ſuſtains the body being broken and debilitated both by reaſon of the wound, and concreat or clotted blood; for ſo putting on the quality of poyſon, it greatly diſſipates and diſſolves the ſtrength of the heart. Signs that there is blood poured into the capacity of the Cheſt.

It is a ſign the ſpinall marrow is hurt, when a Convulſion or Palſie, that is, a ſodain loſs of ſenſe and motion in the parts thereunder, an unvoluntary excretion of the Urine and other excrements, or a totall ſuppreſſion of them, ſeiſes upon the Patient. When the hollow vein and great Artery are wounded, the Patient will dye in a ſhort time, by reaſon of the ſodain and aboundant effuſion of the blood and ſpirits, which intercepts the motion of the Lungs and heart, whence the party dyes ſuffocated. Signs that the ſpine is wounded.

CHAP. XXX. *Of the cure of the Wounds of the Cheſt.*

WE have read in *John de Vigo*, that it is diſputed amongſt Chirurgeons concerning the conſolidation of wounds of the Cheſt. For ſome think that ſuch wounds muſt be cloſed up, and cicatrized with all poſſible ſpeed, leſt the cold air come to the heart, and the vitall ſpirits fly away and be diſſipated. Others on the contrary think that ſuch wounds ought to be long kept open; and alſo if they be not ſufficiently large of themſelves, that then they muſt be inlarged by Chirurgery, that ſo the blood poured forth into the capacity of the Cheſt may have paſſage forth, which otherwiſe by delay would putrefie, whence would enſue an increaſe of the feaver, a fiſtulous ulcer, and other pernicious accidents. The firſt opinion is grounded upon reaſon and truth, if ſo be that there is little or no blood poured forth into the capacity of the Cheſt; But the latter takes place where there is much more blood contained in the empty ſpaces of the Cheſt. Which, leſt I may ſeem raſhly to determin, I think it not amiſs to ratifie each opinion with a hiſtory thereto agreeable. *Vigo tract. de vuln. thorac. cap. 10.*

Whilſt I was at *Turin*, Chirurgeon to the Marſhall of *Montejan*, the King of *France* his Generall, I had in cure a Souldier of *Paris*, whoſe name was *Leveſque*, he ſerved under captain *Renovart*. He had three wounds, but one more grievous than the reſt, went under the right breſt, ſomewhat deep into the capacity of the Cheſt, whence much blood was poured forth upon the midriffe, which cauſed ſuch difficulty of breathing, that it even took away the liberty of his ſpeech; beſides through this occaſion he had a vehement feaver, coughed up blood, and a ſharp pain on the wounded ſide. The Chirurgeon which firſt dreſt him, had ſo bound up the wound with a ſtrait and thick ſuture, that nothing could flow out thereat. But I being called the day after, and weighing the preſent ſymptomes which threatned ſpeedy death, judged that the ſowing of the wound muſt ſtraight be looſed; which being done there inſtantly appeared a clot of blood at the orifice thereof, which made me to cauſe the Patient to lye half out of his bed, with his head downwards, and to ſtay his hands on a ſettle which was lower than the bed, and keeping himſelf in this poſture, to ſhut his mouth and noſe that ſo his Lungs ſhould ſwell, the midriffe be ſtretched forth, and the intercoſtall muſcles and thoſe of the *Abdomen* ſhould be compreſſed, that the blood poured into the Cheſt might be evacuated by the wound; but alſo that this excretion might ſucceed more happily, I thruſt my finger ſomewhat deep into the wound, that ſo I might open the orifice thereof being ſtopped up with the congealed blood; and certainly I drew out ſome ſeven or eight ounces of putrefied & ſtinking blood by this means. When he was laid in his bed, I cauſed frequent injections to be made into the wound of a decoction of Barly with Honey of Roſes and red Sugar, which being injected I wiſht him to turn firſt on the one, and then on the other ſide, and then, again to lye out of his bed as before: for thus he evacuated ſmal, but very many clots of blood, together with the liquor lately injected; which being done, the ſymptomes were mitigated, & left him by little and little. The next day I made another more detergent injection, adding thereto wormwood, centaury, and Aloes; but ſuch a bitterneſs did riſe up to his mouth together with a deſire to caſt, that he could not longer indure it. Then it came into my mind that formerly I had obſerved the like effect of the like remedy in the Hoſpitall A Hiſtory. Why bitter things muſt not be caſt into the Cheſt.

ſpitall of *Paris*, in one who had a fiſtulous ulcer in his Cheſt. Therefore when I had conſidered with my ſelf that ſuch bitter things may eaſily paſs into the Lungs, and ſo may from thence riſe into the Weazon and mouth, I determined that thence forwards I would never uſe ſuch bitter things to my Patients, for the uſe of them is much more troubleſome than any way good and advantagious. But at the length this Patient by this and the like means recovered his health beyond my expectation.

Read the Hiſtory of *Marylius* in *Galen. lib. 7. de Anatom. adminiſtra.*

But on the contrary, I was called on a time to a certain *Germain* gentleman who was run with a ſword into the capacity of his Cheſt, the neighbouring Chirurgeon had put a great tent into the wound at the firſt dreſſing, which I made to be taken forth, for that I certainly underſtood there was no blood powred forth into the capacity of the Cheſt becauſe the Patient had no feaver, no weight upon the *Diaphragma*, nor ſpitted forth any blood. Wherefore I cured him in few dayes by only dropping in ſome of my balſame and laying a plaiſter of *Diacalcitheos* upon the wound. The like cure I have happily performed in many others. To conclude, this I dare boldly affirm, that wounds of the Cheſt by the too long uſe of tents degenerate into Fiſtula's. Wherefore if you at any time ſhall undertake the cure of wounds which penetrate into the capacity of the Cheſt, you ſhall not preſently ſhut them up at the firſt dreſſing, but keep them open for two or three dayes; but when you ſhall find that the Patient is troubled with none or very little pain, and that the midriffe is preſſed down with no weight, and that he breaths freely, then let the tent be taken forth, and the wound healed up as ſpeedily as you can by covering it only with lint dipped in ſome balſame which hath a glutinative faculty, and laid ſomewhat broader than the wound; never apply linimnts to wounds of this kind, leſt the Patient by breathing draw them into the capacity of the Cheſt. Wherefore alſo you muſt have a care that the tent put into thoſe kinds of wounds may be faſtened to the pledgets, and alſo have ſomewhat a large head, leſt they ſhould be drawn as we ſaid into the capacity of the Cheſt, for if they fall in, they will cauſe putrefaction and death. Let *Emplaſt. Decalcitheos* or ſome ſuch like be applyed to the wound. But if on the contrary, you know by proper, and certain ſigns, that there is much blood fallen into the ſpaces of the Cheſt, then let the orifice of the wound be kept open with larger tents, untill all the *Sanies* or bloody matter, wherein the blood hath degenerated, ſhall be exhauſted. But if it happen at any time, as aſſuredly it ſometimes doth, that notwithſtanding the Art and care of the Phyſitian, the wound degenerates into a *Fiſtula*, then the former evill is become much worſe. For *Fiſtula's* of the Cheſt, are ſcarſe cured at any time, and that for divers cauſes. The firſt is, for that the muſcles of the Cheſt are in perpetuall motion; Auother is, becauſe they on the contrary inſide are covered only with the membrane inveſting the ribs, which is without blood. The third is, for that the wound hath no ſtay, by means whereof it may be compreſſed, ſowed, and bound, whereby the lips being joyned together, the wound may at length be repleniſhed with fleſh and cicatrized.

What harm enſues the too long uſe of tents.

No liniments muſt be uſed in wounds of the Cheſt.

Wounds of the Cheſt eaſily degenerate into a *Fiſtula*.

But the reaſon why wounds of the Cheſt do every day heap up and pour forth ſo great a quantity of matter, ſeems to be their vicinity to the heart, which being the fountain of blood, there is a perpetuall efflux thereof from thence to the part affected. For this is natures care in preſerving the affected parts, that continually and aboundantly without meaſure or mean it ſends all its ſupplyes, that is, blood and ſpirits to the aid. Add hereto, that the affected parts by pain, heat, and continuall motion of the Lungs and midriffe, draw and allure much blood to themſelves. Such like blood defiled by the malignity and filth of the wound, is ſpeedily corrupted; whence it is that from the perpetuall afflux of blood, there is a continuall efflux of matter or filth, which at the laſt brings a man to a conſumption; becauſe the ulcerated part like a ravenous wolf conſumes more blood by the pain, heat and motion than can be miniſtred thereto by the heart. Yet if there be any hope to cure and heal the *Fiſtula*, it ſhall be performed, (after the uſe of diet, phlebotomy, and according to the preſcript of the Phyſitian) by a vulnerary potion, which you ſhall find deſcribed when we treat of the *Caries* or rottenneſs of the bones. Wherefore you ſhall make frequent injections therewith into the *Fiſtula*, adding and mixing with it *ſyrupus de roſis ſiccis* and *mel roſarum*. Neither do I, if the putrefaction be great, fear to mix therewith *Ægyptiacum*. But you muſt have a care to remember & obſerve the quantity of the injected liquor, that you may know whether it all come forth again after it hath performed its detergent office. For if any thereof remain behind in the corners and crooked paſſages, it hurts the part, as corrupted with the contagion thereof,

VVhy there flows ſuch plenty of matter out of wounds of the Cheſt.

The cure of a *Fiſtula* in the Cheſt.

VVhen *Ægyptiacum* muſt be put into the injections.

The form of a Syringe fit to make injection, when a great quantity of liquor is to be injected into any part.

After the injected liquor is come forth, a pipe of gold, ſilver or lead, ſhall be put into the fiſtulous ulcer; and it muſt have many holes in it, that ſo the filth may paſs forth at them; it muſt be faſt tyed with ſtrings, that it may not fall into the capacity of the Cheſt. A great ſpunge ſteeped in *aqua vitæ*, and wrung forth again, ſhall be laid hot to the end or orifice thereof, both to hinder the entrance of the air into the Fiſtulous ulcer, as alſo to draw forth the filth there by its gentle heat, the which thing the Patient ſhall much further if often times both day and night he hold his breath, ſtopping his mouth and noſe, and lying upon the diſeaſed ſide, that ſo the *Sanies* may be the more forcibly evacuated; neither muſt we leave the putting in the pipe, before that this fiſtulous ulcer ſhall be almoſt dry, that is, whole, as when it yeelds little, or no matter at all; then it muſt be cicatrized. But if the orifice of this fiſtulous ulcer being in the upper part hinder the healing thereof, then by a chirurgicall Section, a paſſage ſhall be made in the bottome, as we ſaid before in an *Empyema*.

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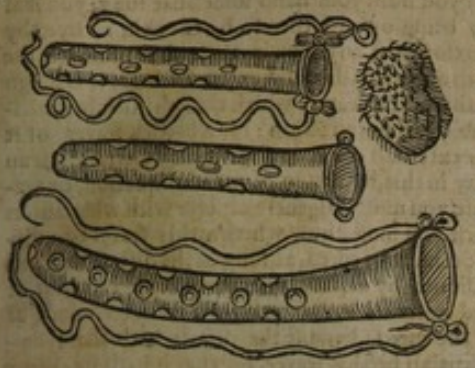
The delineation of the pipes with their strings and sponges.



The Reader must note that the pipes which are fit for this use, need not have so many holes as these here expresst; but only two or three in their ends: for the flesh growing and getting into the rest, make them that they cannot be plucked forth without much pain.

A wound made in the Lungs admits cure, unless it be very large, if it be without inflammation; if it be on the skirts of the Lungs, and not on their upper parts; if the Patient contain himself from coughing much, and contentious speaking, and great breathing: for the wound is inlarged by coughing, and thence also arises inflammation; the *Pus* and *Sanies* whereof, whilst the lungs again indeavour to expell by coughing, by which means they are only able to expell that which is hurtfull and troublesome to them, the ulcer is dilated, the inflammation augmented, the Patient wastes away, and the disease becomes incurable. What wounds of the Lungs are curable. The harm that infues upon coughing in wounds of the Lungs.

There have bin many *Eclegma's* described by Physitians for to clense the ulcer; which when the Patient useth, he shall lye on his back, to keep them long in his mouth, so to relax the muscles of the *Larinx*; for thus the medicine will fall by little and little alongst the coats of the weazon, for if it should fall down in geeat quantity, it would be in danger to cause coughing. Cows, Asses, or Goats milk with a little hony, lest they should corrupt in the stomach, are very fit remedies for this purpose; but womans milk exceeds the rest. How *Eclegma's* must be swallowed.

But Sugar of Roses is to be preferred before all other medicines, in the opinion of *Avicen*, for that it hath a detergent, and also an astrictive and strengthening faculty, than which nothing is more to be desired in curing of ulcers. When you shall think it time to agglutinate the clensed ulcer, you must command the Patient to use emplastick, austere, and astringent medicines, such as are *Terra sigillata*, *bolus armenus*, *hypocystis*, plantain, knot-grass, *Sumach*, *acacia* and the like, which the Patient shall use in his broaths and *Eclegma's*, mixing therewith honey of roses, which serving for a vehicle to the rest, may carry away the impacted filth which hinders agglutination. But seeing an hective feaver easily follows upon these kinds of wounds, and also upon the affects of the Chest and lungs, it will not be amiss to set down somewhat concerning the cure thereof, that so the Chirurgeon may know to administer some help to his Patient, whilst a Physitian is sent for, to overcome this disease with more powerfull and certain remedies. The utility of Sugar of roses in ulcerated or wounded Lungs.

CHAP. XXXII. *Of the differences, causes, signs and cure of an Hective Feaver.*

An Hective feaver is so called, either for that it is stubborn and hard to cure and loose, as things which have contracted a habit; for *Hexis* in Greek signifies a habit; or else for that it seises upon the solid parts of our bodies called by the Greeks *Hexeis*; both which the Latin word *Habitus* doth signifie. The reason of the name.

There are three kinds, or rather degrees of this feaver. The first is when the hectick heat consumes the humidity of the solid parts. The second is, when it feeds upon the fleshy substance. The third and uncurable is, when it destroyes the solid parts themselves. For thus the flame of a lamp first wastes the oyl, then the proper moisture of the weik. Which being done there is no hope of lighting it again what store of oyl soever you poure upon it. This feaver very seldome breeds of it self, but commonly follows after some other. The differences thereof.

Wherefore the causes of a hective feaver are, sharp and burning feavers not well cured, especially if their heat were not represt with cooling epithemes applyed to the heart and *Hypochondria*. If cold water was not fitly drunk. It may also succeed a Diary feaver which hath been caused and begun by some long, great and vehement grief or anger, or some too violent labour, which any of a slender and dry body hath performed in the hot sun. It is also oft-times caused by an ulcer or inflammation of the Lungs, an *empyema* of the Chest, by any great and long continuing *Phlegmon* of the Liver, stomach, mesentery, wombe, kidneys, Bladder, of the guts *Jejunum* and *Colon*, and also of the other Guts, if the *Phlegmon* succeed some long *Diarrhœa*, *Lienteria* or bloody flux, whence a consumption of the whole body, and at last a hectick feaver, the heat becoming more acrid, the moisture of the body being consumed. The causes.

This kind of feaver as it is most easily to be known, so is it most difficult to cure; the pulse in this feaver is hard, by reason of the dryness of the Artery which is a solid part; and it is weak by reason of the debility of the vitall faculty, the substance of the heart being assaulted. But it is little and frequent because of the distemper and heat of the heart, which for that it cannot by reason of its weakness cause a great pulse to cool it self, it labours by the ostenness to supply that defect. The Signs.

But for the pulse, it is a proper sign of this feaver, that one or two houres after meat the pulse feels stronger than usuall; and then also there is a more acrid heat over all the Patients body. The heat of this flame lasts untill the nourishment be distributed over all the Patients body; in which time the dryness of the heart in some sort tempered and recreated by the appulse of moist nourishment, the heat increases no otherwise than lime which a little before seemed cold to the touch, but sprinkled and moistened with water grows so hot, as it smoaks and boyls up. At other times there is a perpetuall equality of heat & pulse in smalness, faintness, obscurity, frequency, and hardness, without any exacerbation, so that the Patient cannot think himself to have a feaver, yea he cannot complain of any thing, he feels no pain, which is another proper sign of an hectick feaver. The cause that the heat doth not Why in hectick the heat is more acrid after meat.

shew

The signes of a hectick joyned with a putrid feaver.

shew its self is, it doth not possesse the surface of the body, that is, the spirits and humors, but lyes as buried in the earthy grosnesse of the solid parts. Yet if you hold your hand somewhat long, you shal at last perceive the heat more acrid and biting, the way being opened thereto by the skin rarifyed by the gentle touch of the warm and temperate hand. Wherefore if at any time in these kind of feavers the Patient feel any pain, and perceive himself troubled with an inequality and excesse of heat, it is a sign that the hectick feaver is not simple, but conjoined with a putrid feaver, which causeth such inequality, as the heat doth more or lesse seise upon matter subject to putrefaction; for a hectick feaver of it self is void of all equality, unlesse it proceed from some externall cause, as from meat; Certainly if an Hippocratique face may be found in any disease, it may in this, by reason of the colliquation, or wasting away the triple substance. In the cure of this disease, you must diligently observe with what affects it is entangled, and whence it was caused. Wherefore first you must know whether this feaver be a disease; or else a symptome. For if it be symptomaticall, it cannot be cured, as long as the disease the cause thereof, remains uncured; as if an ulcer of the guts occasioned by a bloody flix shall have caused it, or else a fistulous ulcer in the Chest caused by some wound received on that part, it will never admit of cure, unlesse first the fistulous or dysenterick ulcer shall be cured; because the disease feeds the symptomes, as the cause the effect. But if it be a simple and essentiall hectick feaver, for that it hath its essence consisting in an hot and dry distemper, which is not fixed in the humors, but in the solid parts, all the counsell of the Physitian must be to renue the body, but not to purge it; for only the humors require purging, and not the defaults of the solid parts. Therefore the solid parts must be refrigerated and humected; which we may doe by medicins taken inwardly and applyed outwardly.

The cure.

A symptomaticall hectick.

An essentiall hectick.

Things to be taken inwardly.

The things which may with good success be taken inwardly into the body for this purpose, are medicinall nourishments. For hence we shall find more certain and manifest good, than from altering medicins, that is, wholly refrigerating and humecting without any manner of nourishment.

The benefit of medicinall nourishments.

For by reason of that portion fit for nutriment which is therewith mixed they are drawn and carried more powerfully to the parts, and also converted into their substance: whereby it comes to passe that they do not humect and coole them lightly and superficially, like the medicins which have only power to alter and change the body, but they carry their qualities more throughly even into the innermost substance. Of these things some are herbs, as violets, purslain, bugloss, endive, duckes-meat, or water lentill, mallowes, especially when the belly shall be bound. Some are fruits, as gourds, cowcumbers, apples, prunes, raisons, sweet almonds, and fresh or new pine-apple kernells; in the number of seeds are the foure greater and lesser cold seeds, and these new, for their native humidity, the seeds of poppyes, berberies, quinces. The flowers of bugloss, violets, water lillies, are also convenient; of all these things let broth be made with a chicken, to be taken in the morning for eight or nine dayes, after the first concoction.

The choice of meats.

For meats; in the beginning of the disease, when the faculties are not too much debilitated, he shall use such as nourish much and long, though of hard digestion; such as the extream parts of beasts, as the feet of Calves, Hogs feet not salted, the flesh of a Tortois, which hath lived so long in a garden, as may suffice to digest the excrementitious humidity; the flesh of white Snails, and such as have been gathered in a vineyard, of frogs, river Crabs, Eels taken in clear waters, and well cooked, hard egs eaten with the juyce of Sorrell without spices; Whitings and stockfish. For all such things because they have a tough and glutinous juice, are easily put and glutinated to the parts of our body, neither are they so easily dissipated by the feaverish heat. But when the patient languisheth of a long hectick, he must feed upon meats of easie digestion, and these boyled rather than roasted; for boyled meats humect more, & roasted more easily turn into choler. Wherefore he may use to eat Veal, Kid, Capon, Pullet, boiled with refrigerating and humecting hearbs; he may also use Barly creams, Almond milks, as also bread crummed and moistened with rose water and boyled in a decoction of the foure cold seeds with sugar of roses; for such a Panada cools the liver, and the habit of the whole body, & nourisheth withall. The Testicles, wings, and livers of young cocks, as also figs and raisons. But if the Patient at length begin to loath and grow weary of boyled meats, then let him use roast, but so that he cut away the burnt & dryed part thereof, and feed only on the inner part thereof, & that moistned in rose water, the juice of Citrons, Oranges or Pomegranats. Let him abstain from salt and dry fishes, and chuse such fishes as live in stony waters, for the exercise they are forc'd to undergoe in shunning the rocks beaten upon by the waves. Asses milk newly milked and seasoned with a little salt, sugar, honey, or fennell, that it may not corrupt, nor grow sowre in the stomach; or womans milk sucked from the dug by the Patient, to the quantity of halfe a pint, is much commended; verily womans milk is the more wholsome, as that which is more sweet and familiar to our substance, if so be that the nurse be of a good temper and habit of body. For so it is very good against the gnawings of the stomach, and ulcers of the Lungs, from whence a Consumption often proceeds. Let your milch Asse be fed with barly, oats, oakleaves; but if the Patient chance to be troubled with the flux of the belly, you shall make the milk somewhat astringent by gently boiling it, and quenching therein pebble stones heated red hot. But for that all natures cannot away with Asses milk, such shall abstain from it, as it makes to have acrid belchings, difficulty of breathing, a heat and rumbling in the *Hypochondria*, and pain of the head. Let the Patient temper his wine with a little of the waters of Lettuce, purslain and water-lillies, but with much bugloss water, both for that it moystens very much, as also for that it hath a specifick power to recreate the heart, whose solid substance in this kind of disease is grievously afflicted. And thus much of things to be taken inwardly.

How Asses milk must be used in a hectick.

VVomans milk more wholsome than Asses.

Things to be outwardly applyed.

These things which are to be outwardly applyed, are inunctuous, baths, epithemes, clysters. Inunctions are divers, according to the various indication of the parts whereto they are applyed. For *Galen* anoints all the spine with cooling and moderate astringent things, as which may suffice to streng-

then

then the parts,and hinder their wasting,& not let the transpiration;for if it should be letted, the heat would become more acrid,by suppressing the vapours.Oyl of roses, water lillies, Quinces, the mucilages of Gum tragacanth and arabick extracted into water of nightshade, with some small quantity of camphire,and a little wax if need require;but on the contrary, the parts of the breast must be annointed with refrigerating and relaxing things;by refrigerating I mean things which moderately cool,for cold is hurtfull to the breast. But astringent things would hinder the motion of the muscles of the chest,and cause a difficulty of breathing. Such inunctions may be made of oyl of Violets, willowes, of the seeds of lettuce,poppies,water-lillies, mixing with them the oyl of sweet almonds to temper the astriction which they may have by their coldness. But you must have great care that the Apothecary for covetousness in stead of these oyls newly made give you not old, rancid and salted oyls, for so in stead of refrigerating,you shall heat the part;for wine,honey and oyl acquire more heat by age; in defect of convenient oyls,we may use butter well washed in violet and nightshade water.The use of such inunctions,is to cool,humect and comfort the parts whereto they are used; they must be used evening and morning,chiefly after a bath.

A caution in the choice of Oyls.

Now for Baths,we prescribe them either only to moisten, and then plain warm water wherein the flowers of Violets and water lillies, willow leaves and barly have beed boyled, will be sufficient; or else not only to moisten,but also to acquire them a fairer and fuller habit, and then you may adde to your bath the decoction of a sheeps head and Gather,with some butter. But the Patient shall not enter into the bath fasting, but after the first concoction of the stomach, that so the nourishment may be drawn by the warmness of the bath into the whole habit of the body, for otherwise he which is sick of a consumption and shall enter the bath with his stomach empty, shall suffer a greater dissipation of the triple substance,by the heat of the bath, then his strength is well able to endure. Wherefore it is fit thus to prepare the body, before you put it into the bath.The day before in the morning let him take an emollient clyster, to evacuate the excrements baked in the guts by the hectick dryness; then let him eat to his dinner some solid meats about nine of the clock; and let him about foure of the clock eat somewhat sparingly,meats of easie digestion to his supper. A little after midnight let him sup off some chicken broth or barly cream,or else two rear egs tempered with some rose water and sugar of roses in stead of salt.Some 4 or 5 houres after,let him enter into the bath,these things which I have set down, being observed.When he comes out of the bath, let him be dryed and gently rubbed, with soft linnen cloaths,and anointed as I formerly prescribed, then let him sleep if he can for two or three houres in his bed:when he wakes let him take some Ptisan,or some such like thing, and then repeat his bath after the foresaid manner.He shall use this bath thrice in ten dayes;But if the Patient be subject to crudities of the stomach,so that he cannot sit in the bath without fear of sowning and such symptomes,his stomach must be strengthned with oyl of Quinces,Wormwood and mastich,or else with a crust of bread tosted,and steeped in muskadine,and strewed over with the powders of Roses, Sanders, and so laid to the stomach,or behind neer to the thirteenth *vertebra* of the back,under which place,Anatomy teaches, that the mouth of the stomach lyes. Epithemes shall be applyed to the liver and heart, to temper the too acrid heat of these parts,and correct the immoderate dryness by their moderate humidity. Now they shall be made of refrigerating and humecting things,but chiefly humecting; for too great coldness would hinder the penetration of the humidity into the part lying within. The waters of bugloss,and Violets,of each a quartern with a little white wine is convenient for this purpose.But that which is made of French barly,the seeds of gourds, pompions, or Cowcumbers of each three drams in the decoction,and mixed with much tempering with oyl of Violets, or of sweet almonds,is most excellent of all other.Let cloaths be dipped and steeped in such epithemes, and laid upon the part, and renued as oft as they become hot by the heat of the part.And because in hectick bodies,by reason of the weakness of the digestive faculty,many excrements are usually heaped up, and dryed in the guts, it will be convenient,all the time of the disease to use frequently clysters made of the decoction of cooling and humecting herbs,flowers,and seeds wherein you shall dissolve *Cassia* with sugar and oyl of Violets, or water-lillies.But because there often happen very dangerous fluxes in a confirmed hectick feaver, which shew the decay of all the faculties of the body, and wasting of the corporeall substance, you shall resist them with refrigerating and assisting medicins; and meats of grosser nourishment, as Rice, and Cicers; and application of astringent and strengthening remedies; and using the decoction of Oats or parched barly for drink.Let the Patient be kept quiet and sleeping as much as may be,especially if he be a child. For this feaver frequently invades children by anger, great and long fear, or the two hot milk of the nurse,overheating in the Sun,the use of wine and other such like causes; they shall be kept in a hot and moist ayre,have another Nurse,and be anointed with oyl of violets;to conclude,you shall apply medicins which are contrary to the morbifick cause.

The differences of Baths.

VVhy the patients must not enter the Bath fasting.

How to prepare the body for the Bath.

Things strengthening the ventricle.

Epitheme.

What a flux happening in a hectick feaver indicates.

How children be cured.

CHAP. XXXIII. *Of the wounds of the* Epigastrium *and of the whole lower belly.*

THe wounds of the lower belly are sometimes before, sometimes behind, some only touch the surface thereof,others enter in;some passe quite through the body,so that they often leave the weapon therein;some happen without hurting the contained parts; others grievously offend these parts, the liver, spleen, stomach, guts,kidneys,womb, bladder, ureters, and great vessells,so that oft-times a great portion of the Kall, falls forth.We know the Liver is wounded, when a great quantity of blood comes forth of the wound, when a pricking pain reaches even to the sword-like griftle,to which the Liver adheres.Oft-times more choler is cast up by vomit, and the Patient lyes on his belly with more ease and content.

Their differences.

Signs of a wounded liver.

Signs that the stomach and smaller guts are wounded.

When the stomach or any of the small guts are wounded,the meat & drink break out at the wound, the *Ilia* or flanks swell and become hard,the hicket troubles the Patient,and oft-times he casts up more

choler, and grievous pain wrings his belly, and he is taken with cold sweats, and his extream parts wax cold.

Signs to know when the greater guts are wounded.

If any of the greater guts shall be hurt, the excrements come forth at the wound: When the Spleen is wounded, there flows out thick and black blood, the Patient is oppressed with thirst, and there are also the other signs, which we said use to accompany the wounded Liver. A difficulty of making water troubles the Patient whose reins are wounded, blood is pissed forth with the Urine, and he hath a pain stretched to his groins and the regions of the Bladder and Testicles.

Signs that the Kidneyes are hurt.

Signs that the Bladder is wounded.

The Bladder or Ureters being wounded, the flanks are pained, and there is a Tension of the *Pecten* or share, blood is made in stead of urine, or else the urine is very bloody, which also divers times comes forth at the wound. When the wombe is wounded, the blood breaks forth by the privities, and the Symptomes are like those of the Bladder.

Signs that the wombe is wounded.

The wounds of the liver are deadly, for this part is the work-house of the blood, wherefore necessary for life; besides by wounds of the liver the branches of the Gate or Hollow veins are cut, whence ensues a great flux of blood not only inwardly, but also outwardly, and consequently a dissipation of the spirits and strength.

Prognosticks. *Lib. 6. cap. 88.*

But the blood which is shed inwardly amongst the bowels putrefies and corrupts, whence followes pain, a feaver, Inflammation, and lastly death. Yet *Paulus Ægineta* writes, that the lobe of the Liver may be cut away without necessary consequence of death. Also the wounds of the Ventricle and of the small Guts, but chiefly of the *Jejunum* are deadly; for many vessells run to the *Jejunum* or empty Gut, and it is of a very nervous and slender substance, and besides it receives the cholerick humor from the bladder of the Gall. So also the wounds of the Spleen, Kidneys, Ureters, Bladder, Womb and Gall, are commonly deadly, but alwayes ill, for that the actions of such parts are necessary for life; besides, divers of these are without blood and nervous others of them receive the moist excrements of the whole body, and lye in the innermost part of the body, so that they do not easily admit of medicins. Furthermore, all wounds which penetrate into the capacity of the belly, are judged very dangerous, though they do not touch the contained bowels; for the encompassing and new ayr entring in amongst the bowels, greatly hurts them, as never used to the feeling thereof; adde hereto the dissipation of the spirits which much weakens the strength. Neither can the filth of such wounds be washed away according to the mind of the Chirurgeon, whereby it happens, they divers times turn into fistula's, as we said of wounds of the Chest, and so at length by collection of matter cause death. Yet I have dressed many who by Gods assistance & favour have recovered of wounds passing quite through their bodies.

A History. I can bring as a witness the steward of the Portingall Embassadour, whom I cured at *Melun*, of a wound made with a sword so running through his body, that a great quantity of excrements came forth of the wounded Guts, as he was a dressing, yet he recovered.

Another History. Not long agoe *Giles le Maistre* a Gentleman of *Paris* was run quite through the body with a Rapier, so that he voided much blood at his mouth and fundament divers dayes together, whereby you know the Guts were wounded; and yet he was healed in twenty dayes. In like sort the wounds of the greater vessels are mortall, by reason of the great effusion of blood and spirits which ensues thereupon.

CHAP. XXXIIII. *The cure of wounds of the lower belly.*

THe first cogitation in curing of these wounds ought to be whether they pierce into the capacity of the Belly; for those which passe no further than the *Peritoneum* shall be cured like simple wounds which only require union. But those which enter into the capacity must be cured after another manner. For oft times the Kall or Guts, or both fall forth at them.

The cure of a wounded Gut.

A gut which is wounded must be sowed up with such a seam as Furriers or Glovers use, as we formerly told you; and then you must put upon it a powder made of Mastich, Myrrh, Aloes and Bole. Being sowed up, it must not be put up boysterously together and at once into its place, but by little and little, the Patient lying on the side opposite to the wound. As for example, the right side of the Guts being wounded and falling out by the wound, the Patient shall lye on his left side, for the more easy restoring of the faln down Gut, and so on the contrary. If the lower part of the Guts being wounded slide through the wound, then the Patient shall lye with his head low down, & his buttocks raised up by putting a pillow under them; If the upper part be hurt, then must he lye quite contrary, that the Guts falling downwards by such a site, may give way to these which are faln out through the wound. But often in this case, the Guts having taken cold by the encompassing ayre, swell up and are distended with wind, the which you must discuss before you put them into their place, with a fomentation of the decoction of camomill, melilot, aniseeds and fennell applyed with a spunge, or contained in a bladder; or else with chickens, or whelps cut alive in the midst and laid upon the swelling; for thus they do not only discuss the flatulency, but also comfort the afflicted part. But if the inflation cannot thus be discussed, the wound shal be dilated, that so the Guts may return the more freely to their place.

The cure when the Kall falls out. *Hip. Aph. 58. sect. 6.*

If the Kall shall fall out, it must be speedily restored to its place, for it is very subject to putrefie; for the fat, whereof for the most part it consists, being exposed to the ayre, easily loses its native heat, which is small and weak, whence a mortification ensues. Hence is that of *Hippocrates*; If the Kall fall out, it necessarily putrefies. The Chirurgeon shall know whether it putrefie, or not, by the blackness and the coldness you may perceive by touching it; neither must you when it putrefies presently restore it to its place, for so the contagion of the putrefaction would spread to the rest of the parts: but whatsoever thereof is putrefied shall be twitched and bound hard with a string and so cut off, and the rest restored to his proper place: but it's good after cutting of it away to leave the string still hanging thereat, that so you may pluck and draw forth whatsoever thereof may by being too strait bound fall away into the capacity of the belly. Some think it to be better to let the Kall thus bound to hang forth untill

till that portion thereof which is putrefied fall away of it self, and not to cut it off. But they are much deceived, for it hanging thus would not cover the guts, which is the proper place. The Guts and Kall being put up, if the wound be great and worth speaking of, it must be sowed with that suture which is termed *Gastroraphia*; but this kind of suture is thus made. The needle at the first putting in must only take hold of the *Peritonæum*, and then on the opposite side only of the flesh, letting the *Peritonæum* alone, & so go along putting the needle from without inwards, and from within outwards, but so that you only take the musculous flesh & skin over it, & then only the *Peritonæum*, until you have sowed up all the wound. He which doth otherwise shall undergo this danger, that whereas the coat *Peritonæum* is of it self without blood, it being divided, or wounded cannot of it self be united to it self, therefore it requires an intercourse of flesh: otherwise unless it be thus united by the benefit of the flesh intermixed therewith, there would remain an uncurable tumor after the wound is cicatrized on the outside. But that which we said before according to *Galens* mind, that all the wounds must be sowed, it is not so to be taken as if that the wound must be sowed up to the very end; for in the lower part of the wound there must be left a certain small vent by which the quitture may pass forth, which being wholly cleansed and exhausted, the wound must be quite healed up. But the wounds which shall penetrate into the substance of the liver, spleen, ventricles, and other bowells, the Chirurgeon shall not suffer them to be without medicines as if they were desperate, but here shall spare neither labour nor care to dress them diligently. For doubtfull hope is better then certain despair. The bladder, womb, & right gut being wounded, detergent and agglutinative injections shal be put up by their proper passages. I have read nothing as yet in any Author of the wounds of the fat, for al of them refer the cure therof to the wounds of the Muscles. Yet I wil say this by the way, that wounds of the fat how deep soever they be, if they be only simple, may be dressed wihout putting in of any Tent, but only dropping in some of my balsam, and then laying upon it a plaister of *Gratia Dei*, or some such like, for so they will heal in a short time.

Lib. 6. Meth. cap. 4.

The cure of the wounded fat.

CHAP. XXXV. *Of the wounds of the Groins, Yard and Testicles.*

WHen the Groins and neighbouring parts are wounded, we must first consider whether they pierce to within: and if they do penetrate, to what inward parts they come, whether to the bladder, the womb, or right gut: for these parts are such neer neighbours that oft-times they are all wounded with one blow. But for the wounds of the Testicles, and genitall parts, because they are necessary instruments for the preserving the *species* by generation, or a succession of individualls, and to keep all things quiet at home, therefore the Chirurgeon ought to be very diligent and carefull for their preservation. Wherefore if they should chance at any time to be wounded, they shall be dressed as we have formerly delivered, the medicines being varied according to the state of the wound, and the appearing and happening symptoms; for it would be a thing of immense labour to handle all things in particular.

CHAP. XXXVI. *Of the Wounds of the Thighes and Legs.*

WOunds which have been received on the inside of the Thighes, have often caused sodain death, if they have come to the vein *Saphena*, or the great Artery, or the Nerves, the associates of these vessels. But when they are simple, there is nothing which may alter the usuall manner of cure. Yet the Patient must be carefull to lye in his bed: for the vulgar *Italian* proverb is true: *La mano al petto, la gamba al letto*, [that is, the hand on the breast, and the leg on the bed.] But when they penetrate more deeply into the substance of the part, they bring horrid and fearfull symptomes, as an inflammation, an abscess, from whence oft-times such aboundance of matter issues forth, that the Patient falls into an *Atrophia* and consumption. Wherefore such wounds and ulcers require a carefull & industrious Chirurgeon, who may fitly make incisions necessary for the corrupt parts, & callosity of the fistulous ulcer. Some Chirurgeons have been so bold as to sow together the end of the Tendons of the Ham, and of other joints, when they have been quite cut asunder. But I durst never attempt it for fear of pain, convulsions and the like horrid Symptoms. For the wounds of that large tendon which is composed in the calf of the Leg by the concourse of three muscles, and goes to the heel, I have observed that when it hath been cut with the sword, that the wounds have been long and hard to cure; and besides when at the last they have been healed, as soon as the Patient hath got out of his bed, and indeavoured to go, they have grown ill and broke open again. Wherefore in such like wounds let the Patient have a care that he begin not to go or too boldly to use his hurt leg before it be perfectly cicatrized and the scar grown hard. Therefore that the Patient may be in more safety, I judg it altogether necessary, that he use to go with Crutches, for a good while after the wound is perfectly healed up.

VVhy wounds of the inside of the thigh are oft-times deadly.

The large Tendon of the heel hard to consolidate.

CHAP. XXXVII. *Of the Wounds of the Nerves and nervous parts.*

THe continuity of the nervous parts is divers wayes loosed by the violent incursion of external things; as by things which contuse, batter and grind in sunder, as by the blow of a stone, cudgell, hammer, lance, bullet out of a gun, or crosbow; by the biting of greater teeth; or the pricking of some sharpe thing, as a needle, bodkin, penknife, arrrow, splinter; or the puncture of some venemous thing, as of a Sea Dragon; or the edg of some cutting thing, as a sword or rapier; or of stretching things which violently tear asunder the nervous bodies. Hence therefore it is, that of such wounds some are simple, others compound, and the compound, some more compound than other. For of these some are superficiary and short, others deep and long, some run alongst the nervous body, others run broadwayes; some cut the part quite asunder, others only a portion thereof. The symptomes which follow upon such wounds are, vehement pain, and defluxion, inflammation, abscess, feaver, *deliri-*

Differences drawn from things wounded.

Their symptomes.

an, ſowning, convulſion, gangrene, ſphacell; whence often death inſues by reaſon of that ſympathy, which all the nervous parts have with the brain. Amongſt all the wounds of the nervous parts, there is none more to be feared then a puncture, or prick, nor any which cauſeth more cruell and dangerous ſymptomes. For by reaſon of the ſtraitneſs of the wound, medicines can neither be put in, nor the ſanious matter paſs forth; now the ſanious matter by long ſtay acquires virulency, whereby the nervous parts are tainted and ſwoln, ſuffer pain, inflammation, convulſions, and infinite other ſymptomes; of theſe the wounds are moſt dangerous, by which the nervous and membranous bodies are but half cut aſunder. For the portion thereof which remains whole, by its drawing & contracting it ſelf towards the originall, cauſeth great pain and convulſion by ſympathy. The truth hereof is evident in wounds of the head, as when the *pericranium* is half cut, or when it is cut to apply a trepan. For the cutting thereof infers far greater pain, than when it is cut quite aſunder. Wherefore it is ſafer to have the nervous body quite cut off, for ſo it hath no community, nor conſent with the upper parts, neither doth it labour, or ſtrive to reſiſt the contraction of its ſelf; now this contrariety, and as it were fight, is the cauſe of pain, yet there ariſes another miſery from ſuch a wound, for the part whereinto the nerve which is thus cut inſunder paſſes, thence forwards loſeth its action.

Why a puncture of a nerve is deadly.

CHAP. XXXVIII. *Of the cure of Wounds of the Nervous parts.*

IT is the ancient doctrine of the antient Phyſitians, that the wounds of the nervous parts ſhould not preſently be agglutinated (which notwithſtanding the generall and firſt indication uſually taken from the ſolution of continuity requires) but rather, chiefly if they be too ſtrait, that the punctures ſhould be dilated, by cutting the parts which are above them, and let them be kept long open that the filth may paſs freely forth, and the medicine enter well in. Yet I in many cures have not followed this counſel, but rather that which the common indication requires.

A wound of of the nervous parts indicates contrary to the general cure of wounds.

That cure is in freſh memory which I performed upon *Monſieur le Cocq*, a Proctor of the ſpirituall court, who dwelt in our Ladies ſtreet; he gathering and binding up ſome looſe papers, run a penknife which was hid amongſt them, through his hand. Alſo one of his neighbours who went to ſpit a piece of beef, thruſt the ſpit through the midſt of his hand; But I preſently agglutinated both their wounds, without any danger, dropping preſently in at the firſt dreſſing a little of my balſam warm, and putting about it a repelling and aſtringent medicine, and by this means they were both of them healed in a ſhort time, no ſymptome thereupon happening. Yet I would not have the young Chirurgeon to run this hazard, for firſt he muſt be well practiſed and accuſtomed to know the tempers and habits of men; for this manner of curing would not do well in a plethorick body, or in a body replete with ill humors, or indued with exquiſite ſenſe. Therefore in ſuch a caſe it will be ſafer to follow the courſe here ſet down. For wounds of the nerves do not only differ from other wounds, but alſo among themſelves in manner of curing. For although all medicines which draw from far, and waſte ſanious humors, may be reputed good for the wounds of the nerves; yet thoſe which muſt be applyed to punctures and to thoſe nerves which are not wholly laid open, ought to be far more powerful, ſharp & drying, yet ſo that they be not without biting, that ſo penetrating more deep they may draw forth the matter, or elſe conſume and diſcuſs that which either lies about the nerves, or moiſtens their ſubſtance. On the contrary, when the ſinews are bared from fleſh and adjoyning partieles, they ſtand in need but of medicines, which may only dry. Here you may furniſh your ſelves with ſufficient ſtore of medicines good for the nerves howſoever pricked. As R. *Terebinth. ven. & olei veteris an.* ℥ j. *aquæ vitæ parum.* Or R. *olei Terebinth.* ℥j. *aquæ vitæ* ℥ j. *euphor.* ℥ ß. Or R. *radices Dracontiæ, Brioniæ, valerianæ, & gentianæ exſiccatas, & in pulverem redactas, miſce cum decocto centaurii, aut oleo, aut exungia veteri*; drop hereof warm into the wound as much as ſhall ſuffice. Or elſe put ſome Hogs, Gooſe, Capons, or Bears greaſe, old oil, oil of Lillies or the like, to *Galbanum*, pure Rozin, *opopanax* diſſolved in *aqua vitæ* and ſtrong vinegar. Or R. *olei hypericonis ſambuci, & de euphorbio an.* ℥ j. *ſulphuris vivi ſubtiliter pulveriſati* ℥ ß, *gummi ammoni. bdellii an.* ℥ ij. *aceti boni* ℥ ij. *vermium terreſt. præparat.* ℥ j. *bulliant omnia ſimul ad conſumptionem aceti.* Let as much hereof as ſhall ſuffice be dropped into the wound; then apply this following cerate, which draws very powerfully. R. *olei ſupra ſcripti* ℥ j. *terebinth. venet.* ℥ ß. *diachylonis albi cum gummi,* ℥ x. *ammoniac. bdellii in aceto diſſolutorum, an.* ℥ ij. *reſin. pini, gum. elemi, picis navalis an.* ℥ v. *cereæ quod ſufficit, fiat ceratum ſatis molle.* We muſt uſe ſome whiles one, ſome whiles another of theſe medicines in punctures of the Nerves with choiſe and judgment, according to their conditions, manner, depth, and the temperaments and habit of the wounded bodies. But if the pain yeeld not to ſuch remedies, but rather increaſe, with the inflammation of the affected part, a ſwelling of the lips of the wound, and ſweating forth of a ſerous, thin and virulent matter or filth, then you ſhall poure into it ſcalding oil, and ſhall touch three or four times not only the ſurface of the wound but the bottom thereof with a rag dipped therein and tyed to the end of a *ſpatula*. For this will take away the ſenſe from the Nerve, Tendon, or Membrane, like as if they were burnt with a cautery, and ſo the pain will be eaſed. So in the moſt grievous pains of rotten teeth, the thruſting of an hot iron into their roots, or ſtopping them with cotten dipped in oyl of Vitriol, or *aqua vitæ*, gives moſt certain eaſe; for by burning the nerve which is inſerted into their roots, the ſenſe and ſo conſequently the pain is taken away. So alſo in malignant, gnawing, eating, and ſpreading ulcers, which are alwaies aſſociated with much pain, the pain ceaſes by applying an Eſcharotick, as the powder of Alum, or Mercury, or *ægyptiacum* made ſomewhat more ſtrong than uſuall. That the young Chirurgeon may be more ready for this practiſe and the uſe of the former medicines, I have thought good to inſert the following Hiſtory both for the lateneſs of the thing and the pleaſing memory of the moſt laudable Prince.

Medicins fit for wounds of the netves.

VVhat wounds of the Nerves muſt be burnt.

A certain Anodyne in pain of the teeth.

VVhy Eſcharoticks muſt be uſed to ſpreading ulcers.

A famous hiſtory.

Charles the ninth, the French King, being ſick of a Feaver, *Monſieur Chapellan* and *Caſtellan* his Phyſitians thought it fit he ſhould be let blood; for the performance whereof, there was called a Chirurgeon wondrous famous for that buſineſs; but when as he by chance had pricked a nerve in ſtead of a vein, the

King

King cryed out, that he felt a mighty pain in that place. Then I bid, that the ligature should straightwaies be looſed, otherwiſe the arm would preſently be much ſwelled. But he going ſlowly about it, behold the arm began to ſwel with ſuch contraction, that he could not bend it, nor put it forth, and cruel pain moleſted not only the pricked particle, but all the whole member beſides. I forthwith laid upon the wound a plaiſter of *Baſilicon*, to hinder the agglutination thereof, & then I wrapped al the arm in a double linnen cloth dipped in oxycrate, putting upon it an expulſive ligature, which beginning at the wriſt and ending at the top of the ſhoulder, might keep the blood and ſpirits from fear of defluxion and inflammation. This being thus performed, we went aſide to conſult what was neceſſary to be done, both to aſſwage the pain, as alſo to divert the other ſymptoms, which uſually happen upon punctures of the nerves. I being deſired, thus delivered my opinion, that in my mind, there were nothing better, then preſently to drop into the wound ſome oyl of Turpentine warmed and mixed with a little *aqua vitæ*. And then all the arm ſhould be covered with a plaiſter of *Diacalcitheos* diſſolved in vinegar and oyl of Roſes, bound over and beſides with the expulſive ligature, which we formerly mentioned. For the oyl and *aqua vitæ* have a faculty to penetrate into the bottome of the wound, and to exhauſt and dry up the ſerous and virulent humor, which ſweats from the ſubſtance of the pricked nerve; and alſo to mitigate the pain by its actuall heat. Furthermore the emplaiſter *Diacalcitheos* hath a faculty to diſſolve the humor which hath already fallen down into the arm, and to hinder the entrance and defluxion of any new matter. And the ligature is ſuch as by its moderate aſtriction would ſerve to ſtrengthen the muſcles, and to preſs out and repell the humors which were fallen down into the upper part, and to prohibit that which is ready to fall down. Mine advice being approved of the Phyſitians both in word and deed, the pain was mitigated. But the humor ſtayed in the part, for the diſſolving and drying whereof, this following remedy was uſed. ℞. *far. hordei & orobi an.* ℥ ij. *flor. chamæm. & melilot. an.* p. ij. *butyr. recentis ſine ſale* ℥ i ß. *lixivii barbitonſoris quod ſufficit, fiat cataplaſma ad formam pultis.* By theſe remedies the King at the laſt after 3. months ſpace was perfectly healed, ſo that there remained no ſign of the depraved action in the part. But if at any time there ſhall be ſo great contumacy, that it will not yeeld to theſe means, but that there is imminent danger of a convulſion; it will be better to cut it in ſunder whether Nerve, Tendon or Membrane, than to expoſe the Patient to the danger of a deadly convulſion; for thus indeed the peculiar action of that part will be loſt, but the whole body preſerved thereby; for ſo we had determined by common conſent, that if the pain which afflicted the King would not yeeld to the preſcribed remedies, either to poure in ſcalding oyl, or elſe to cut the ſinew quite aſunder.

A diſcuſſing and drying cataplaſm.

For the late and ſad memory of Miſtris *Courtin* dwelling in the ſtreet of the holy-Croſs was in our minds, who of a vein not well opened in her arm fell into a Gangrene and totall mortification of that whole part, of which ſhe dyed, becauſe ſhe was not dreſſed with the formerly mentioned medicins. Yet we muſt abſtain from theſe too powerfull remedies, when the pricked nerve ſhall lye bare, for elſe the pain would be increaſed, & more grievous ſymptoms follow. Wherefore as I formerly wiſhed, more mild medicins muſt be applyed, which may dry up the ſerous humor without biting or acrimony, as ℞. *terebinth. venet. in aq. roſ. lotæ* ℥ ij. *boli armeni ſubtiliter pulveriſati,* ℥ ij. *incorporentur ſimul.* Our Balſam alſo is excellent in this caſe, and this of *Vigoes* wheeh follows. ℞ *olei roſar. omphacini* ℥ j ß. *olei de terebinth.* ℥ iij. *ſucci plantag.* ℥ ß. *ſemin. hypericonis aliquantulum contriti, m.* ß. *tutiæ præpar.* ℥ iij. *calcis decies lotæ cum aqua plantagin.* ℥ ij. *antimonii* ℥ j. *ſevi hircini, & vitulini, an.* ℥ v. *vermium terreſtrium cum vino lotorum* ℥ j ß. *bulliant omnia ſimul dempta tutia in cyatho decoctionis hordei, ad conſumptionem aquæ & vini, colentur, rurſumq; igni admoveantur, addendo tutiam, & fiat linimentum cum cera alba, &* ℥ ß. *croci.* This liniment aſſwages pains, & covers the bared nerves with fleſh. This cure of punctured nerves, may with choiſe and judgment and obſerving the proportion of the parts be transferred to the pricked Tendons and membranes. But take this as a generall & common rule, that all nervous bodies howſoever hurt, are to be comforted by anointing them with hot oyls, ſuch as the oyls of Bayes, Lillies, of Worms, Sage, or ſome other ſuch like remedy being applyed to their originalls and more notable paſſages; as to the originall of the ſpinall marrow, the armpits and groins. Neither do I think it fit in this place to omit an affect which ſometimes happens to the large Tendon of the heel, of which we formerly made mention. For it oft-times is rent or torn by a ſmall occaſion without any ſign of injury or ſolution of continuity apparent on the outſide as by a little jump, the ſlipping aſide of the foot, the too nimble getting on horſeback, or the ſlipping of the foot out of the ſtirrop in mounting into the ſaddle. When this chance happens it will give a crack like a Coachmans whip; above the heel, where the tendon is broken, the depreſſed cavity may be felt with your finger, there is great pain in the part, and the party is not able to go. This miſchance may be amended by long lying and reſting in bed, and repelling medicins applyed to the part affected in the beginning of the diſeaſe, for fear of more grievous ſymptomes, and then applying the Black plaiſter, or *Diacalcitheos* or ſome other ſuch, as need ſhall require; neither muſt we hereupon promiſe to our ſelves or the Patient certain or abſolute health. But on the contrary at the beginning of the diſeaſe we muſt foretell that it will never be ſo cured but that ſome reliques may remain, as the depreſſion of the part affected and depravation of the action and going; for the ends of this broken or relaxed Tendon by reaſon of its thickneſs and contumacy cannot eaſily be adjoined, nor being adjoined, united.

A Hiſtory.

An anodyne and Sarcotick Balſam.

A generall rule for all wounds of all Nervous parts.

CHAP. XXXIX. *Of the wounds of the joynts.*

Why wounds of the joynts are malignant.

BEcauſe the wounds of the joynts have ſomething proper and peculiar to themſelves, beſides the common nature of wounds of the Nerves, therefore I intend to treat of them in particular. Indeed they are alwayes very dangerous, and for the moſt part deadly by reaſon of the nervous productions and membranous Tendons wherewith they are bound and ingirt and into which the Nerves are inſerted: whereby it comes to paſs, that the exquiſite ſenſe of ſuch like parts will eaſily bring malign ſymptomes, eſpecially if the wound poſſeſs an internall, or as they term it, a domeſtique part of them; as for example, the armpits, the bending of the arm, the inner part of the

wriſt,and ham,by reaſon of the notable Veins,Arteries,and Nerves of theſe parts,the looſed continuity of all which brings a great flux of blood,ſharpe pain and other malignant ſymptomes; all which we muſt reſiſt according to their nature and condition,as a flux of blood with things ſtaying, bleeding;pain with anodynes.If the wound be large and wide,the ſevered parts ſhall be joined with a future,leaving an orifice in the lower part,by which the quitture may paſs forth.This following powder of *Vigoes* deſcription muſt be ſtrewed upon the ſuture. R. *thuris ſang.draconis,boli armen.terræ ſigill.an.* ʒ ij. *aloes,maſtich.an.*ʒ j.*fiat pulvis ſubtilis*. And then the joynt muſt be wrapped about with a repercuſſive medicine compoſed of the whites of Egs,a little oil of Roſes,Bole,Maſtich,and barly flowre. If it be needfull to uſe a Tent,let it be ſhort,and according to the wound thick,leſt it cauſe pain:and moreover let it be anointed with the yolk of an eg,oil of Roſes, waſhed turpentine and a little ſaffron. But if the wound be more ſhort & narrow,it ſhal be dilated,if there be occaſion,that ſo the humor may paſs away more freely.You muſt reſt the part,and beware of uſing cold,relaxing,mollifying,humecting, and unctuous medicines,unleſs peradventure the ſharpneſs of the pain muſt be mitigated. For on the contrary,aſtringent and deſiccant medicins are good,as this following cataplaſm. R: *furfur. macri, farin. hordei,& fabarum.an.*ʒ iiij.*ſiorum chamæ.& melil.an.*m.ß.*terebinth.*ʒ iij.*mellis communis*ʒ ij.*ol. myrtin.* ʒ j. *oxymelitis, vel oxycrat.vel lixivii com.quantum ſufficit,fiat cataplaſma ad formam pultis*.Or you may compoſe one of the lees of wine,Wheat bran,the powder of Oaken bark,cypreſs nuts,galls and Turpentine, and ſuch like,that have an aſtringent,ſtrengthening and drying quality,and thereby aſſwaging pain, and hindering the deſluxion of humors. This following medicine is aſtringent and agglutinative.R *terebinth. venet.*ʒ ij.*aq.vitæ parum,pulveris maſtich.aloes,myrrhæ,boli armen.an.*ʒ ij.And alſo our balſam wil be good in this caſe,if ſo be that you add hereto ſo much powder which dryes without acrimony,as occaſion ſhal ſerve.I admoniſhed you before to take heed of cold, and now again ; for it is hurtfull to all wounds and ulcers,but eſpecially to theſe of the nervous parts;hence it is that many dye of ſinal wounds in the winter,who might recover of the ſame wounds though greater in the Summer.For cold according to *Hippocrates* is nipping to ulcers,hardens the skin, and hinders them from ſuppuration, extinguiſheth naturall heat,cauſes blackneſs,cold aguiſh fits,convulſions,and diſtentions.Now divers excrements are caſt forth of wounds of the joynts,but chiefly albugineous,that is,reſembling the white of an eg, and mucous,and ſometimes a very thin water,all which ſavour of the nature of that humor which nouriſheth theſe parts.For to every part there is appropriate for his nouriſhment and conſervation, a peculiar balſam,which by the wound flows out of the ſame part,as out of the branches of the vine,when they are pruned,their radicall moiſture or juyce flows,whence alſo a *Callus* proceeds in broken bones.Now this ſame mucous,& albugineous humor,ſlow & as it were frozen flowing from the wounded joynts,ſhews the cold diſtemper of the parts,which cauſe pain,not to be orecome by medicins only potentially hot. Wherefore to correct that,we muſt apply things actually hot,as beaſts and ſwines bladder half full of a diſcuſſing decoction,or hot bricks quenched in wines.Such actuall heat helps nature to concoct and diſcuſs the ſuperfluous humor impact in the joynts,and ſtrengthens them;both which are very neceſſary,becauſe the naturall heat of the joynts is ſo infirm that it can ſcare actuate the medicin unleſs it be helped with medicins actually hot. Neither muſt the Chirurgeon have the leaſt care of the figure and poſture of the part, for a vicious poſture increaſes ill ſymptomes,uſes to bring to the very part though the wound be cured,diſtortion,numneſs, incurable contraction;which fault leſt he ſhould run into,let him obſerve what I ſhall now ſay;If the forepart of the ſhoulder be wounded, a great boulſter muſt be under the armpit,and you muſt carry your arm in a ſcarf, ſo that it may bear up the lower part of the arm,that ſo the top of the ſhoulder may be elevated ſomewhat higher, and that ſo it may be thereby more ſpeedily and happily agglutinated and conſolidated.If the lower part be wounded, when fleſh begins to be generated and the lips of the wound to meet,you muſt bid the Patient to move and ſtir his arms divers wayes ver & anon,for if that be omitted or negligently done,when it is cicatrized,then it will be more ſtiffe and leſs pliable to every motion ; and yet there is a further danger leſt the arm ſhould totally loſe its motion.If the wound be upon the joynt of the elbow,the arm ſhal be placed and ſwathed in a middle poſture,that is,which neither too ſtraitly bows it,nor holds it too ſtiffly out; for otherwiſe when it is cicatrized,there will be an impediment either in the contraction or extention. When the wound is in the wriſt, or joints of the fingers either externally or internally,the hand muſt be kept half ſhut,continually moving a ball therein.For if the fingers be held ſtraight ſtretched forth,after it is cicatrized,they will be unapt to take up or hold any thing,which is their proper faculty.But if after it is healed, it remain half ſhut, no great inconveniency will follow thereon;for ſo he may uſe his hand divers wayes to his ſword, pike, bridle and in any thing elſe. If the joints of the Hip be wounded,you muſt ſo place the Patient that the thigh bone may be kept in the cavity of the huckle-bone,and may not part a hairs breadth there from,which ſhall be done with linnen boulſters and ligatures applyed as is fitting,and lying full upon his back.When the wound ſhall begin to cicatrize, the Patient ſhall uſe to move his thigh every way, leſt the head of the thigh-bone ſtick in the cavity of the huckle-bone without motion.In a wound of the knee,the leg muſt be placed ſtraight out,if the Patient deſire not to be lame.When the joints of the feet and toes are wounded,theſe parts ſhall neither be bended in nor out,for otherwiſe he will not be able to go. To conclude,the ſite of the foot and leg, is quite contrary to that of the arm and hand.

The cure.

An aſtringent and drying cataplaſm.

*Aphor.*20. *ſect.*5.

VVhat matter uſually flows from wounds of the joynts.

VVhy things actually hot muſt be applyed to the wounded joynts.

Of the ſite and poſture of wounded joints.

CHAP. XL. *Of the wounds of the Ligaments.*

THe wounds of the Ligaments,beſides the common manner of curing theſe of the Nerves, have nothing peculiar,but that they require more powerfull medicins, for their agglutination,deſiccation and conſolidating;both becauſe the Ligamentall parts are harder,and dryer, and alſo for that they are void of ſenſe. Therefore the foreſaid cure of Nerves,and joints may be uſed for theſe wounds:for the Medicins in both are of the ſame kind,but here they ought to be ſtronger

Ligaments more dry than Nerves,and without ſenſe.

stronger and more powerfully drying. The Theory and cure of all the symptomes which shall happen thereupon have been expressed in the Chapter of curing the wounds of the nervous parts, so that here we shall need to speak nothing of them, for there you may find as much as you will. Wherefore here let us make an end of wounds, and give thankes to God the author and giver of all good for the happy processe of our labours, and let us pray that that which remaines may be brought to a happy end, and secure for the health and safety of good people.

The end of the tenth Booke.

Of Wounds made by Gunshot, other fiery Engines, and all sorts of Weapons.

THE ELEVENTH BOOK.

The Preface.

I Have thought good here to premise my opinion of the originall, encrease, and hurt of fiery Engines, for that I hope it will be an ornament and grace to this my whole treatise: as also to intice my Reader, as it were with these junckets, to our following Banquet so much savouring of Gunpowder. For thus it shall be known to all whence Guns had their originall and how many habits and shapes they have acquired from poore and obscure beginnings; & lastly how hurtfull to mankind the use of them is. *Polydore Virgill* writes that a Germane of obscure birth and condition was the inventor of this new engin which we term a Gun, being induced thereto by this occasion. He kept in a mortar covered with a tyle, or slate, for some other certain uses a powder (which since that time for its chief and new known faculty, is named Gunpowder.) Now it chanced as he struck fire with a steel and flint, a spark thereof, by accident fell into the mortar, whereupon the powder suddainly catching fire, casts the stone or tyle which covered the mortar, up on high; he stood amazed at the novelty & strange effect of the thing, and withall observed the formerly unknown faculty of the powder; so that he thought good to make experiment thereof in a small Iron trunk framed for that purpose according to the intention of his mind. When all things were correspondent to his expectation, he first shewed the use of his engine to the Venetians, when they warred with the Genoveses about *Fossa Clodia*, in the year of our Lord 1380. Yet in the opinion of *Peter Messias*, their invention must have been of greater antiquity; for it is read in the Chronicles of *Alphonsus* the eleaventh King of *Castile*, who subdued the Isles *Argezires*, that when he besieged the chiefe Town in the year of our Lord 1343. The besieged Moores shot as it were thunder against the assailants, out of Iron mortars. But we have read in the Chronicles written by *Peter* Bishop of *Leons* of that *Alphonsus* who conquered *Toledo*, that in a certain sea fight fought by the King of *Tunis*, against the Moorish King of *Sivill*, whose part King *Alphonsus* favoured, the *Tunetans* cast lightning out of certain hollow Engins or Trunks with much noise. Which could be no other, than our Guns, though not attained to that perfection of art and execution which they now have.

Lib. 2. de inven. rerum.

Cap. 8. prim. part. var. lect.

I think the deviser of this deadly Engin hath this for his recompence, that his name should be hidden by the darkness of perpetuall ignorance, as not meriting for this his most pernicious invention, any mention from posterity. Yet *Andrew Thevet* in his Cosmography published some few years agone, when he comes to treat of the *Suevi*, the inhabitants of Germany, brings upon the authority and credit of a certain old Manuscript, that the Germane the inventer of this warlike Engine was by profession a Monk and Philosopher or Alchimist, born at *Friburg*, and named *Constantine Anclzen*. Howsoever it was, this kind of Engine was called *Bombarda* (*i*) a Gun, from that noise it makes, which the Greeks and Latines according to the sound call *Bombus*; then in the following ages, time, art and mans maliciousness added much to this rude and unpolisht invention. For first for the matter, Brasse and Copper, metalls farre more tractable, fusible and lesse subject to rust, came as supplies to Iron. Then for the form, that rude and undigested barrell, or mortar-like masse, hath undergone many formes and fashions, even so far as it is gotten upon wheels, that so it might run not only from the higher ground, but also with more rapid violence to the ruin of mankind; when as the first and rude mortars seemed not to be so nimbly traversed, nor sufficiently cruell for our destruction by the only casting forth of Iron and fire. Hence sprung these horrible monsters of Canons, double Canons, Bastards, Musquits, Field peeces; hence these cruell and furious beasts, Culverins, Serpentines, Basiliques, Sackers, Falcons, Falconets, and divers other names not only drawn from their figure and making, but also from the effects of their cruelty. Wherefore certainly I cannot sufficiently admire the wisdome of our Ancestors, who have so rightly accommodated them with names agreeable to their natures; as those who have not only taken them from the swiftest birds of prey, as Falcons; but also from things most harmfull and hatefull to mankind, such as Serpents, Snakes, and Basiliques. That so we might clearly discern, that these engines were made for no other purpose, nor with other intent, but only to be imployed for the speedy and cruell slaughter of men; and that by only hearing them named we might detest and abhor them, as pernicious enemies of our lives. I let passe other engines of this offspring, being for their quantity small, but so much the more pernicious & harmefull, for that they neerer assail our lives, may traiterously and forthwith seise upon us not thinking nor fearing any such thing; so that we can scarse have

VVho the inventor of Guns.

The reason of the name.

The danger of Pistols.

have any means of escape; such are Pistols and other small hand-guns, which for shortness you may carry in your pocket, and so privily and suddainly taking them forth oppress the careless and secure. Fowling peeces which men usually carry upon their shoulders, are of the middle rank of these engines, as also Muskets and Caleevers, which you cannot wel discharge unless lying upon a Rest, which therefore may be called Breast-guns for that they are not laid to the cheek, but against the Breast by reason of their weight and shortness; All which have been invented for the commodity of footmen, and light horsemen. This middle sort of engine we call in Latine by a generall name *Sclopus*, in imitation of the sound, and the Italians who term it *Sclepetere*; the French call it *Harquebuse*, a word likewise borrowed from the Italians, by reason of the the touch-hole by which you give fire to the peece, for the Italians call a hole *Buzzo*. It is tearmed *Arcus (i)* a Bow, for that at this present it holds the same place in martiall affaires, as the Bow did of old; and as the Archers formerly, so at this day the Musquetiers are placed in front. From the same wretched shop and magazine of cruelty, are all sorts of Mines, Countermines, pots of fire, trains, fiery Arrowes, Lances, Crossebowes, barrels, balls of fire, burning faggots, Granats, and all such fiery engines and Inventions, which closely stuffed with fuell and matter for fire, and cast by the defendants upon the bodies and Tents of the assailants, easily take fire by the violence of their motion. Certainly a most miserable and pernicious kind of invention, whereby we often see a thousand of heedlesse men blown up with a mine by the force of Gunpowder; otherwhiles in the very heat of the conflict you may see the stoutest souldiers seised upon with some of these fiery Engines, to burn in their harnesse, no waters being sufficiently powerfull to restrain and quench the raging and wasting violence of such fire cruelly spreading over the body and bowells. So it was not sufficient to have armes, Iron and fire to mans destruction, unlesse also that the stroak might be more speedy, we had furnished them, as it were with wings, so to fly more hastily to our own perdition, furnishing sithebearing death with wings so more speedily to oppress man, for whose preservation, all things contained in the world were created by God. Verily when I consider with my self all the sorts of warlike Engines, which the ancients used, whether in the field in set battlls, as Bowes, Darts, Crosbowes, Slings; or in the assault of Cities, & shaking or overturning their walls, as Rams, Horses, woodden towres, slings and such like; they seem to me certain childish sports & games made only in imitation of the former. For these modern inventions are such as easily exceed all the best appointed and cruell Engines which can be mentioned or thought upon, in the shape, cruelty and appearance of their operations. For what in the world is thought more horrid or fearfull than thunder and lightning? and yet the hurtfulness of thunder is almost nothing to the cruelty of these infernall Engines; which may easily appear by comparing together both their effects. Man alone of all creatures is not alwayes killed by being touched with thunder; but it immediatly killeth all other things which are subject to be toucht therewith. Nature bestowing this honour upon him, seeing so many creatures exceed him in strength: For all things ly contrary to man; and man, unless he be overthrown with it, doth not dye thereof. But these fire-spitting Engines do no more spare man, then they do other creatures, and kill without difference from whence soever they come, whither soever they are carryed, and howsoever they touch. There are many, but more are said to be the remedies against thunder; for beside the charms whereby the ancient Romans did suppose they might be driven away, they never penetrate deeper into the ground than five foot, therefore such as was fearfull thought the deeper caves most safe. Of those things which grow out of the earth, they do not touch the Bay tree, and that was the cause that it was counted a sign of Victory both in ancient and moderne times. Wherefore *Tiberius Cæsar* otherwise a contemner of God and religion, as he who indued with the Mathematicall sciences thought all things governed by Fate, yet because he exceedingly feared thunder, he alwayes carried a Lawrell wreath about his neck when the aire was troubled, for that this kind of leafe is reported not to be touched by thunder. Some report that he made him tents of Seales skinnes, because it toucheth not this kinde of creature of all these things that live in the Sea, as neither the Eagle amongst birds, which for that is fained to be *Joves* squire. But on the contrary, charmes, the victorious Bay, the Seale or Sea-calfe, the Eagle or any such thing profits nothing against the violence of these fiery engines: no not a wall of ten foot thick will advantage. Lastly, this argues the immense violence of brasen Cannons above thunder, for that thunder may be dispersed and driven away with the noise and ringing of Bells, the sounding of Trumpets, the tinkling of brasen kettles, yea also by the shooting of such great Ordnance; to wit, the clouds, by whose collision and fight the Thunder is caused, being dispersed by this violent agatation of the air, or else driven further to more remote parts of the skies. But their fury once provoked, is stayed by no opposition, appeased by no remedy. As there are certain seasons of the year, so also there are certain Regions of the earth, wherein Thunder is seldome or never heard. Thunders are rare in Winter and Summer, and that for contrary causes; for that in Winter the dense air is thickned with a thicker coat of clouds, and the frosty and cold exhalation of the earth extinguisheth what fiery vapours so ever it receives; which thing keeps *Scythia* and the cold countries about it free from Thunder. And on the contrary, too much heat preserves *Egypt*. For hot and dry exhalations of the earth are condensed into very thin, subtile and weak clouds. But as the invention, so also the harm and tempest of great Ordnance, like a contagious pestilence is spread and rages over all the earth, and the skies at all times sound again with their reports. The Thunder and Lightning commonly gives but one blow, or stroke, and that commonly strikes but one man of a multitude; But one great Cannon at one shot may spoil and kill a hundred men. Thunder, as a thing naturall, falls by chance, one while upon a high oak, another while upon the top of a mountain, and somewhiles on some lofty towre, but seldom upon man. But this hellish Engine tempered by the malice and guidance of man, assailes man only, and takes him for his only mark, and directs his bullets against him. The Thunder by its noise as a messenger sent before, foretells the storm at hand; but, which is the chief mischief, this infernall Engine roars

A comparison of the antient weapons with the modern.

Plini. Lib. 2. Cap. 59.

Plin. Lib. 2. Cap. 55.

Sueton. in Tiberio.

The wondrous force of great Ordnance.

Plin. Lib. 2. Cap. 50.

juyce therein: then he strained it through a towell without much pressing; and added the Turpentine roars as it strikes, and strikes as it roars, sending at one and the same time the deadly bullet into the breast, and the horrible noise into the ear. Wherefore we all of us rightfully curse the author of so pernicious an Engine; on the contrary praise those to the skies, who endeavour by words and pious exhortations to dehort Kings from their use, or else labour by writing and operation to apply fit medicins to wounds made by these Engins. Which hath moved me, that I have written hereof almost with the first of the French. But before I shall do this, it seemeth not amisse, so to facilitate the way to the treatise I intend to write of wounds made by Gunshot, to premise two Discourses, by which I may confute and take away certain erroneous opinions which have possessed the mindes of divers; for that unless these be taken away, the essence and nature of the whole disease cannot be understood, nor a fitting remedy applyed by him which is ignorant of the disease.

The first Discourse which is dedicated to the Reader, resells and condemnes by reasons and examples the method of curing prescribed by *John de Vigo*, whereby he cauterizeth the wounds made by Gunshot, supposing them venenate; and on the contrary proves that order of curing which is performed by supuratives, to be so salutary and gentle, as that prescribed by *Vigo* is full of errour and cruelty. The second dedicated to the King, teaches that the same wounds are of themselves void of all poison, and therefore that all their malignity depends upon the fault of the air, and ill humors predominant in the bodies of the patients.

The arguments of the following discourses.

The first discourse wherein Wounds made by Gunshot, are freed from being burnt, or cauterized according to Vigoes *Method.*

IN the year of our Lord 1536. *Francis* the French King, for his acts in war and peace stiled the Great, sent a puissant Army beyond the Alpes, under the government and leading of *Anne* of Mommorancy high Constable of France, both that he might relieve *Turin* with Victualls, souldiers, and all things needfull, as also to recover the Cities of that Province taken by the Marquis of *Guast* Generall of the Emperours forces. I was in the Kings Army the Chirurgeon of Monsieur of *Montejan* Generall of the foot. The Imperialists had taken the straits of *Suze*, the Castle of *Villane*, and all the other passages; so that the Kings army was not able to drive them from their fortifications but by fight. In this conflict there were many wounded on both sides with all sorts of weapons, but chiefly with bullets. I will tell the truth, I was not very expert at that time in matters of Chirurgery; neither was I used to dress wounds made by Gunshot. Now I had read in *John de Vigo* that wounds made by Gunshot were venenate or poisoned, and that by reason of the Gunpowder; Wherefore for their cure, it was expedient to burn or cauterize them with oil of Elders scalding hot, with a little Treacle mixed therewith. But for that I gave no great credit neither to the author, nor remedy, because I knew that caustick could not be powred into wounds, without excessive pain; I, before I would run a hazard, determined to see whether the Chirurgeons, who went with me in the army, used any other manner of dressing to these wounds. I observed and saw that all of them used that Method of dressing which *Vigo* prescribes; and that they filled as full as they could, the wounds made by Gunshot with Tents and pledgets dipped in this scalding Oil, at the first dressings; which encouraged me to do the like to those, who came to be dressed of me. It chanced on a time, that by reason of the multitude that were hurt, I wanted this Oil. Now because there were some few left to be dressed, I was forced, that I might seem to want nothing, and that I might not leave them undrest, to apply a digestive made of the yolk of an egge, oil of Roses, and Turpentine. I could not sleep all that night, for I was troubled in mind, and the dressing of the precedent day, (which I judged unfit) troubled my thoughts; and I feared that the next day I should find them dead, or at the point of death by the poison of the wound, whom I had not dressed with the scalding oil. Therefore I rose early in the morning, I visited my Patients, and beyond expectation, I found such as I had dressed with a digestive only, free from vehemency of pain to have had good rest, and that their wounds were not inflamed nor tumifyed; but on the contrary the others that were burnt with the scalding oil were feaverish, tormented with much pain, and the parts about their wounds were swolne. When I had many times tryed this in divers others, I thought thus much, that neither I nor any other should ever cauterize any wounded with Gunshot. When we first came to *Turin*, there was there a Chirurgeon far more famous than all the rest in artificially and happily curing wounds made by Gunshot; wherefore I laboured with all diligence for two yeers time to gain his favour and love, that so at the length, I might learn of him, what kind of Medicine that was, which he honoured with the glorious title of Balsam, which was so highly esteemed by him, and so happy and successfull to his patients; yet could I not obtain it. It fell out a small while after that the Marshall of *Montejan* the Kings Lieftenant, Generall there in *Piemont* dyed, wherefore I went unto my Chirurgeon, and told him that I could take no pleasure in living there, the favourer and *Mecenas* of my studies being taken away; and that I intended forthwith to return to *Paris*, and that it would neither hinder, nor discredit him to teach his remedy to me, who should be so far remote from him. When he heard this, he made no delay, but presently wished me to provide two Whelpes, 1 pound of earthwormes, 2 pounds of oil of Lillies, six ounces of Venice Turpentine, and one ounce of *aqua vitæ*. In my presence he boyled the Whelpes put alive into that oil, untill the flesh came from the bones, then presently he put in the Wormes, which he had first killed in white wine, that they might so be cleansed from the earthy drosse wherewith they are usually repleat, and then he boiled them in the same oil so long, till they became dry, and had spent all their

Lib. 1. de vulner. Cap. 8.

VVhat chance may do in finding out of remedies.

The description of oil of Whelpes.

juice

to it,and lastly the *aqua vitæ*.Calling God to witness,that he had no other Balsam, wherewith to cure wounds made with Gunshot,and bring them to suppuration.Thus he sent me away as rewarded with a most precious gift,requesting me to keep it as a great secret,and not to reveal it to any. When I came to *Paris*,I went to visit *Silvius* the Kings professor of Physick,wel known by name to all scholars for his great learning;he kept me long that so I might dine with him,and diligently enquires of me,if I had observed any new Method of curing wounds made by Gunshot,and combustions occasioned by Gunpouder. Then I affirmed to him that Gunpouder did not participate any thing of poyson, for that none of these things whereof it is compounded are poysonous;which reason ought to free the whole composition from suspition of poyson. And that experience confirmed this reason,for I had seen many souldiers, who would drink a great quantity of this pouder with Wine, because they were perswaded,that this drink would free them from malign symptomes when they were wounded; yet I give no credit to this perswasion;and lastly,for that many without any harm,strew this pouder upon rebellious ulcers.For the Bullets,I affirm, that they cannot conceive such heat,as to become caustick. For if you shoot them out of a Gun against a hard stone, yet you may presently take them up without any harm in your hands,though by striking upon the stone,they should become more hot.For the combustions caused by Gunpouder, I observed no speciall nor peculiar remedy,which might make their cure different from other combustions. To which purpose I related this insuing history.

Gunpouder not poysonous.

Bullets shot out of a Gun do not burn.

A History.

One of the Marshall of *Montejan* his Kitchin boyes,fell by chance into a Caldron of Oil being even almost boyling hot;I being called to dress him,went to the next Apothecaries to fetch refrigerating medicines commonly used in this case: there was present by chance a certain old countrey woman, who hearing that I desired medicins for a burn,perswaded me at the first dressing,that I should lay two raw Onions beaten with a little salt; for so I should hinder the breaking out of blisters or pustules, as she had found by certain and frequent experience. Wherefore I thought good to try the force of her Medicine upon this greasie scullion.I the next day found those places of his body whereto the Onions lay,to be free from blisters,but the other parts which they had not touched,to be all blistered.

A medicine hindering blistring in burns,or scalds.

It fell out a while after,that a *German* of *Montejan* his guard had his flasque full of Gunpouder set on fire,whereby his hands and face were grievously burnt: I being called,laid the Onions beaten as I formerly told you,to the middle of his face, and to the rest I laid medicins usually applyed to burns. At the second dressing I observed the part dressed with the Onions quite free from blisters & excoriation, the other being troubled with both;wherby I gave credit to the Medicin.Besides also,I lastly told him this,that I had observed,that that was the readiest to draw forth Bullets shot into the body,which sets the Patient in the same posture and site,as he was when he received his hurt.Which things when I had told him,together with many other handled at large in this work,the good old man requested me to publish in print my opinions concerning these things,that so the erroneous and hurtfull opinion of *Vigo* might be taken out of mens minds. To whose earnest intreaty when I had assented, I first of all caused to be drawn and carved many Instruments fit to draw forth Bullets and other strange bodies; then a short while after I first published this work in the year of our Lord 1545. which when I found to be well liked and approved by many,I thought good to set it forth the second time somewhat amended in the year 1552. And the third time augmented in many particulars in the year 1564. For I having followed many Wars, and detained as Chirurgeon in besieged Cities, as *Metz* and *Hesdin*, had observed many things under five Kings, whom I served with diligence and content. I had learnt many things from most expert Chirurgeons, but more from all learned Physitians, whose familiarity and favour for that purpose I alwayes laboured to acquire with all diligence and honest Arts; that so I might become more learned and skilfull by their familiarity and discourse, if there was any thing especially in this matter and kind of wounds, which was hid from me,or whereof I was not well assured.Of which number I have known very few, who any thing seen in this kind of operation either by study,or experience in Wars,who have not thought that Wounds made by Gunshot ought to be dressed at the first with suppurative medicins,and not with scalding and Caustick oil. For this I affirm,which then also I testified to this good man,that I have found very many Wounds made in the fleshy parts by Gunshot,as easily cured as other Wounds, which be made by contusing things.But in the parts of the body where the bullet meets with bones and nervous particles,both because it tears and rends into small peeces those things which resist,not only where it touches,but further also,through the violence of the blow,therefore it causeth many and grievous symptomes,which are stubborn and difficult,and oft-times impossible to cure,especially in bodies replete with ill humors,in an ill constitution of the heaven and air,such as is hot,moist and foggy weather, which therefore is subject to putrefaction; & in like manner a freezing and cold season,which uses to mortifie the wounded parts not only of those that are hurt with Bullets,but in like sort with any other weapon;not only in bony and nervous particles,but also in musculous.Whereby you may understand,that the difficulty of curing proceeds not from the venenate quality of the Wounds; nor the combustion made by the Gunpouder,but the foulness of the Patients bodies,and the unseasonableness of the air.

A History.

Wounds made by Gunshot must be dressed with suppuratives.

The causes of difficulty in this cure.

A History.

For proof whereof,I will set down,that which I not long agone, observed in a Scottish Nobleman the Earl of *Gordon*,Lord of *Achindon*,whom I cured at the appointment of the Queen-Mother. He was shot through both his thighes with a Pistoll,the bone being not hurt nor touched;and yet the 32.day after the Wound he was perfectly healed, so that he had neither feaver nor any other symptom which came upon the Wound.Whereof there are worthy witnesses,the Archbishop of *Glasco*, the Scottish Embassadour,*Francis Brigart*,and *John Altine* Doctors of Physick,as also *Iames Guillemeau* the Kings Chirurgeon,and *Giles Buzet* a Scottish Chirurgeon,who all of them wondred that this Gentleman was so soon healed, no acrid medicin being applyed. This I have thought good to recite and set down, that the Readers may understand,that I for 30.years ago had found the way to cure Wounds made by Gunshot, with-

without scalding oil or any other, more acrid medicin; unless by accident the ilness of the Patients bodies and of the air caused any malign symptomes, which might require such remedies besides the regular and ordinary way of curing, which shall be more amply treated of in the following discourse.

What makes Chirurgeons sometimes use causticks in curing wounds made by Gunshot.

Another Discourse of these things, which King Charles *the Ninth, returning from the expedition and taking of* Roven, *inquired of me concerning Wounds made by Gunshot.*

FOr that it pleased your Majesty one day, together with the Queen Mother, the Prince of the *Rock upon Ton*, and many other Noble men, and Gentlemen, to inquire of me, what was the cause that the far greater part of the Gentlemen and common Souldiers which were wounded with Guns, and other warlike Engines, all remedies used in vain, either dyed, or scarse and that with much difficulty recovered of their hurts, though in appearance they were not very great, and though the Chirurgeons diligently performed all things requisite in their Art: I have made bold to premise this Discourse to that Tractate which I determin to publish concerning wounds made by Gunshot; both to satisfie the desires of the Princes and of many Gentlemen, as also the expectation they have of me, as being the Kings chief Chirurgeon, (which place being given me by *Henry* the Second, *Charles* the Ninth, a Son most worthy of such a Father, had confirmed) neither make I any question, but that many who too much insist upon their own judgment, and not throughly consider the things themselves, will marvail, and think it far from reason; that I departing from the steps of my ancestors, and dissenting wholly from the formerly received opinions, am far from their Tenents, who lay the cause of the malignity of wounds made by Gunshot, upon the poyson brought into the body by the Gunpouder, or mixed with the bullets whilst they are tempered or cast. Yet for all this, if they will curteously and patiently weigh my reasons, they shall either think as I do, or at least shall judg this my indeavour and pains taken for the publike good, not to be condemned nor contemned. For I shall make it evident by most strong reasons drawn out of the writings of the Ancients both Philosophers and Physitians, and also by certain experiments of my own, and other Chirurgeons, that the malignity and contumacy which we frequently meet withall in curing wounds made by Gunshot, is not to be attributed either to the poyson carryed into the body by the Gunpouder or Bullet, nor to burning imprinted in the wounded part by the Gunpouder. Wherefore to come to our purpose, that opinion must first be confuted, which accuseth wounds made by Gunshot of poyson; and we must teach, that there is neither any venenate substance, nor quality in Gunpouder, neither if there should be any, could it impoyson the bodies of such as are wounded. Which that we may the more easily perform, we must examin the composition of such pouder, and make a particular inquiry of each of the simples, whereof this composition consists, what essence they have, what strength and faculties, and lastly, what effects they may produce. For thus by knowing the simples, the whole nature of the composition consisting of them, will be apparently manifest.

The occasion of writing this discourse.

The argument of this discourse.

Gunpouder is not poysonous.

The simples which enter the composition of Gunpouder are only three, Charcoals of Sallow or Willow, or of Hemp stalks, Brimstone, and Salt-peter, and sometimes a little *aqua vitæ*. You shall find each of these, if considered in particular, void of all poyson and venenate quality. For first in the Charcoal you shall observe nothing but dryness, & a certain subtlety of substance, by means whereof it fires so sodainly, even as Tinder. *Sulphur* or Brimstone is hot and dry, but not in the highest degree, it is of an oily & viscid substance, yet so that it doth not so speedily catch fire as the coal, though it retain it longer being once kindled, neither may it be so speedily extinguished. Salt-peter is such, that many use it for salt, whereby it is evidently apparent that the nature of such simples is absolutely free from all poyson, but chiefly the Brimstone, (which notwithstanding is more suspected than the rest.) For *Dioscorides* gives Brimstone to be drunk, or supped out of a rear Egg to such as are Asthmatick, troubled with the cough, spit up purulent matter, and are troubled with the yellow Jaundise. But *Galen* applyes it outwardly to such as are bitten by venemous Beasts, to scabs, teaters, & leprosies. For the *aqua vitæ*, it is of so tenuous a substance that it presently vanisheth into air, and also very many drink it, and it is without any harm used in frictions of the exteriour parts of the body. Whence you may gather, that this pouder is free from all manner of poyson, seeing these things whereof it consists and is composed, want all suspition thereof. Therefore the *Germane* horsemen, when they are wounded with shot, fear not to drink off cheerfully half an ounce of Gunpouder dissolved in Wine; hence perswading themselves freed from such malign symptomes as usually happen upon such wounds; wherein whether they do right or wrong I do not here determin; the same thing many *French* souldiers forced by no necessity, but only to shew themselves more courageous, also do without any harm; but divers with good success use to strew it upon ulcers, so to dry them. Now to come to these, who think that the venenate quality of wounds made by Gunshot, springs not from the pouder, but from the bullet wherewith some poyson hath been commixt or joyned, or which hath been tempered or steeped in some poysonous liquor. This may sufficiently serve for a reply; that the fire is abundantly powerfull to dissipate all the strength of the poyson, if any should be poured upon or added to the Bullet. This much confirms my opinion which every one knows; The Bullets which the Kings Souldiers used to shoot against the Townsemen in the siege of *Roven*, were free from all poyson; and yet for all that they of the Town thought that thay were all poysoned, when they found the Wounds made by them, to be uncurable and deadly. Now

Of what it is made.

Lib. 5. Cap. 73. Lib. 5. simpl. Cap. 36.

Bullets cannot be poysoned.

on the other side the Townsmen were falsly suspected guilty of the same crime by the Kings Army, when as they perceived all the Chirucgrons labour in curing Wounds made by the Bullets shot from *Roven*, to be frustrated by their contumacy and malign nature; each side judging of the magnitude and malignity of the cause from the unhappy success of the effect in curing. Even as amongst Physitians according to *Hippocrates*, all diseases are termed pestilent, which arising from whatsoever common cause, kill many people; so also Wounds made by Gunshot, may in some respect be called pestilent, for that they are more refractory, and difficult to cure than others, and not because they partake of any poysonous quality, but by default of some common cause, as the ill complexions of the Patients, the infections of the air, & the corruption of meats and drinks. For by these causes wounds acquire an evil nature, and become less yeelding to medicins. Now we have by these reasons convinced of error that opinion which held Wounds made by Gunshot for poysonous; let us now come to overthrow that which is held concerning their combustion.

As *Galen* notes *ad sent.* 20 & 21. *sect.* 3. *lib.* 3. *Epid.*

Wounds made by Gunshot are not burnt.

First, it can scarse be understood how bullets which are commonly made of Lead, can attain to such heat, but that they must be melted, and yet they are so far from melting, that being shot out of a Musket they wil pierce through an armour and the whole body besides, yet remain whole, or but a little diminisht. Besides also, if you shoot them against a stone wall, you may presently take them up in your hand without any harm, and also without any manifest sense of heat; though their heat by the striking upon the stone should be rather increased if they had any. Furthermore, a Bullet shot into a barrell of Gunpouder, would presently set it all on fire, if the bullet should acquire such heat by the shooting, but it is not so. For if at any time the pouder be fired by such an accident, we must not imagine that it is done by the bullet bringing fire with it, but by the striking and collision thereof against some Iron, or stone that opposes or meets therewith, whence sparks of fire proceeding as from a flint, the pouder is fired in a moment. The like opinion we have of thatched houses, for they are not fired by the bullet which is shot, but rather by some other thing, as linnen rags, brown paper and the like, which rogues and wicked persons fasten to their bullets. There is another thing which more confirms me in this opinion, which is; take a bullet of Waxe, and keep it from the fire, for otherwise it would melt, and shoot it against an inch board, and it will go through it; whereby you may understand that Bullets cannot become so hot by shooting, to burn like a cautery. But the Orifices (may some say) of such Wounds are alwayes black. This indeed is true, but it is not from the effect of heat brought thither by the bullet, but the force of the contusion. Now the contusion is exceeding great, both because the bullet is round, and enters the body with incredible violence. Of which those that are wounded will give you sufficient testimony, for there is none of them, which thinks not presently upon the blow, that as it were some post, or thing of the like weight, falls upon the affected member, whence great pain and stupidity possess the part, whereby the native heat and spirits are so much dissipated, that a Gangrene may follow. But for the Eschar which they affirm is made by the blow, and falls away afterwards, they are much mistaken. For certain particles of the membranes and flesh contused and torn by the violence of the bullet beguiles them; which presently putrefying are severed from the sound parts by the power of nature and the separating heat, which thing usually happens in all great Contusions. But for all that these so many and weighty reasons may free the Pouder from all suspition of Poison, and the bullet from all thought of burning; yet there are many who insisting upon Philosophicall arguments raise new stirs. For (say they) the discharging a peice of Ordinance is absolutely like Thunder and Lightning, which the rent and torn clouds cast from the middle region upon the earth; wherefore the Iron bullet which is shot out of the Cannon must needs have a venenate and burning faculty. I am not ignorant that Lightning generated of a gross and viscous exhalation, breaking the cloud wherewith it is incompassed, never fals upon the earth, but brings fire with it, one while more subtile, another while more gross, according to the various condition of the matter whence the exhalation hath arisen. For *Seneca* writes that there are three severall kinds of Lightning differing in burning, condition and plenty. One of them penetrates or rather perforates by the tenuity of the matter of the object which it touches. The other with a violent impetuosity breaks in sunder and dissipates the objects, by reason it hath a more dense, compact & forcible matter, like as Whirlwinds have. The third, for that it consists of a more terrestriall matter, burns what it touches, leaving behind it the impression of the burning. Also I know that Lightning is of a pestilent & stinking nature, occasioned by the grosness and viscidity of the matter whereof it is; which matter taking fire sends forth so lothsome & odious a smel, that the very wild beasts cannot indure it, but leave their Dens, if they chance to be touched with such a lightning. Besides also we have read in the Northern history of *Olaus Magnus*, that in some places after a Lightning, you shall find a whole Plain spread over with Brimstone, which Brimstone notwithstanding is extinguished, unprofitable, and of no efficacy. But grant these things be thus, yet must we not therefore conclude, that the Bullets of the great Ordnance carry poyson and fire with them into the wounds. For though there be many things like in Lightning and discharging great Ordnance, yet they have no similitude either in matter or substance, but only in effects, whereby they shake, break in sunder and disperse the bodies which withstand them; For lightning and thunder do it by means of fire, & oft-times of a stone generated in them, which is therefore tearmed, a thunderbolt; but Ordnance by the Bullet carried by the force of the air, more violently driving and forcing it forwards. Neither if any should by more powerful arguments force me to yeeld that the matter of the lightning and shooting of Ordnance are alike, yet will I not therefore be forced to confess that Wounds made by Gunshot are combust. For according to *Pliny*, there are some lightnings which consisting of a most dry matter, do shattter in sunder all that withstands them, but do not burn at all; others which are of somewhat a more humid nature, burn no more than the former, but only black such things as they touch: Lastly, othersome of a more subtile and tenuous matter, whose nature (as *Seneca* saith) we must not doubt to be divine, if but for this reason, that they will melt gold & silver, not harming the purse; a sword, not hurting

The reason why wounds made by Gunshot look black.

The reasons of our adversaries refelled. *Quæst. nat. lib.* 2. *cap.* 49.

The stinking smell of Lightning.

Lib. 2. *cap.* 51.

The wonderfull nature of some lightning.

ing the purse; a sword, not hurting the scabbard; the head of a Lance, not burning the wood, and shed wine not breaking the vessell. According to which decree I can grant, that these Lightnings which break in sunder, melt and dissipate, and performe other effects so full of admiration, are like in substance to the shot of great Ordnance; but not these which carry with them fire and flame.

A History.

In proose whereof there comes into my mind the history of a certain Souldier, out of whose thigh I remember I drew forth a Bullet wrapped in the taffety of his breeches, which had not any sign of tearing or burning. Besides, I have seen many who not wounded, nor so much as touched, yet notwithstanding have with the very report and wind of a Cannon bullet, sliding close by their ears, faln down for dead, so that their members becomming livid and black, they have dyed by a Gangrene ensuing thereupon. These and such effects are like the effects of Lightnings which we lately mentioned, and yet they bear no sign nor mark of poison. From whence I dare now boldly conclude, that Wounds made by Gunshot are neither poisoned, nor burnt. But seeing the danger of such Wounds in these last civill wars hath been so great, universall and deadly to so many worthy personages and valiant men, what then may have been the cause thereof, if it were neither combustion, nor the venenate quality of the Wound? This must we therefore now insist upon and somewhat hardily explain.

Why the wounds made by Gunshot some few years agone were so deadly.

Those who have spent all their time in the learning and searching out the mysteries of Naturall Philosophy, would have all men think and beleeve, that the foure Elements have such mutuall sympathy, that they may be changed each into other; so that they not only undergoe the alterations of the first qualities which are heat, coldnesse, dryenesse and moisture, but also the mutation of their proper substances by rarefaction and condensation. For thus the fire is frequently changed into air, the air into water, the water into air, and the water into earth; and on the contrary, the earth into water, the water into air, the air into fire; because these 4. first bodies have in their common matter enjoyed the contrary and fighting, yet first and principall qualities of all.

The cause of the transmutation of the Elements.

Whereof we have an example in the * Ball-bellowes brought out of Germany, which are made of brasse, hollow and round; and have a very small hole in them, whereby the water is put in, and so put to the fire; the water by the action thereof is rarified into air, and so they send forth wind with a great noise, and blow strongly as soon as they grow throughly hot. You may try the same with Chesnuts, which cast whole and undivided into the fire, presently fly asunder with a great crack; because the watry and innate humidity turned into wind by the force of the fire, forcibly breaks his passage forth. For the air or wind raised from the water by rarifaction, requires a larger place, neither can it now be contained in the narrow filmes, or skins of the Chesnut, wherein it was formerly kept. Iust after the same manner Gunpouder being fiered, turnes into a far greater proportion of air, according to the truth of that Philosophicall proposition, which saith, Of one part of earth, there are made ten of water; of one of water, ten of air; and of one of air are made ten of fire. Now this fire not possible to be pent in the narrow space of the peice, wherein the pouder was formerly contained, endeavours to force its passage with violence, and so casts forth the Bullet lying in the way, yet so that it presently vanishes into air, and doth not accompany the Bullet to the mark, or object, which it batters, spoiles and breaks asunder. Yet the Bullet may drive the obvious air with such violence, that men are often sooner touched therewith than with the bullet, and dye by having their bones shattered and broken without any hurt on the flesh which covers them; which as we formerly noted, it hath common with Lightning. We find the like in Mines, when the pouder is once fiered, it removes & shakes even mountains of earth.

* These bellowes here mentioned by the Author, are Balls made of Brasse in form of a pear, with a very smal hole in their lesser ends: when you would fill them with water you must heat them very hot, and so the air which is contained in them wil be exceedingly rarified, which by putting them presently into water will be condensate as much, and so wil draw in the water to supply the place, *ne detur vacuum*. Then put them into the fire, & it again rarifying the water into air will make them yeeld a strong, continued and forcible blast. The cause of the report and blow of a Cannon.

In the year of our Lord 1562. a quantity of this pouder which was not very great taking fire by accident in the Arcenall of Paris, caused such a tempest, that the whole City shooke therewith, but it quite overturned divers of the neighbouring houses, and shook off the tyles and broke the windowes of those which were further off; & to conclude, like a storme of Lightning it laid many here and there for dead, some lost their sight, others their hearing, and othersome had their limbs torn asunder as if they had been rent with wild horses; and all this was done by the only agitation of the air into which the fired Gunpouder was turned; Iust after the same manner as winds pent up in hollow places of the earth which want vents. For in seeking passage forth, they vehemently shake the sides of the Earth, and raging with a great noise about the cavities, they make all the surface thereof to tremble; so that by the various agitation one while up, another down, it overturnes or carries it to another place. For thus we have read that *Megara* and *Ægina* anciently most famous Cities of Greece were swallowed up and quite overturned by an earthquake; I omit the great blusterings of the windes striving in the cavities of the earth, which represent to such as heare them at some distance, the fierce assailing of Cities, the bellowing of Bullets, the horrid roarings of Lions, neither are they much unlike to the roaring reports of Cannons. These things being thus premised let us come to the thing we have in hand. Amongst things necessary for life, there is none causes greater changes in us than the air; which is continually drawn into the Bowells appointed by nature, and whether we sleep, wake, or what else soever we do, we continuall draw in, and breath it out. Through which occasion *Hippocrates* calls it Divine, for that breathing through this mundane Orbe, it embraces, nourishes, defends and keeps in quiet peace all things contained therein, friendly conspiring with the stars from whom a divine vertue is infused therein. For the air diversly changed and affected by the stars, doth in like manner produce various changes in these lower mundane bodies. And hence it is that Philosophers and Physitians do so seriously with us to behold and consider the culture and habit of places, and constitution of the air, when they treat of preserving of health, or curing diseases. For in these the great power and dominion of the air is very apparent, as you may gather by the foure seasons of the year; for in summer the air being hot and dry, heats and dryes our bodies; but in winter it produceth in us the effects of winters qualities, that is, of cold and moisture; yet by such order and providence of nature, that although according to the varieties of seasons our bodies may be variously altered, yet shall they receive no detriment

A History. The cause of an Earthquake.

How the air becomes hurtfull.

triment thereby, if so be that the seasons retain their seasonableness, from whence if they happen to digress, they raise and stir up great perturbations both in our bodies and minds; whose malice we can scarse shun, because they encompass us on every hand, and by the law of nature enter together with the air into the secret cabinets of our bodies both by occult and manifest passages. For who is he, that doth not by experience find both for the commodity and discommodity of his health, the various effects of winds, (wherewith the air is commixt) according as they blow from this or that Region, or quarter of the world. Wherefore seeing that the South wind is hot and moist; the North wind cold and dry; the East wind clear and fresh; the West wind cloudy; it is no doubt but that the air which we draw in by inspiration carries together therewith into the bowells the qualities of that wind which is then prevalent. When we read in *Hippocrates*, that changes of times, whether they happen by different winds,

Aphor. 17. sect. 3.

or vicissitude of seasons, chiefly bring diseases; For northerly winds do condense, and strengthen our bodies, and make them active, well coloured and daring, by resuscitating and vigorating the native heat. But southern winds resolve and moisten our bodies, make us heavy headed, dull the hearing, cause giddiness, and make the eyes and body less agile; as the Inhabitants of *Narbon* find to their great harme, who are otherwise ranked among the most active people of France. But if we would make a comparison of the seasons and constitutions of a year, by *Hippocrates* decree, Droughts are more wholesome and less deadly than Rains; I judg for that too much humidity is the mother of putrefaction, as you learn by these countries which are blown upon by a wind from Sea. For in these flesh which is kept for food, putrefies in the space of an houre; and such ulcers as in other places are easily and quickly healed, do there by the conflux and collection of matter become inveterate & contumacious. Therefore as when the seasons of the year successively fall out agreeable to their nature, & when each season is seasonable, then either we are not sick at all, or assuredly with less danger. So on the contrary the perfect constitution and health of our bodies becomes worse and decaies, when the seasons of the year are depraved and perverted in time and temper. Now seeing that these many years the four seasons of the year have wanted their seasonableness, the summer wanting his usuall heat, and the winter its cold, and all things by moisture and the dominion of the southern winds have been humid and languid, I think there is none so ignorant in naturall Philosophy and astrology, who will not think that the causes of the malignitie and contumacy of those diseases which have so long afflicted all France, are not to be attributed to the air and Heavens. For otherwise, whence have so many pestilent and contagious diseases tyrannized over so many people of every age, sex and condition? whence have so many catarrhes, coughs and heavinesses of the head, so many plurisies, tumors, small poxes, meazells, and itches not admitting of digestion and remedies prescribed by Art? Whence have we had so many venemous creatures, as Toads, Grashoppers, Caterpillars, Spiders, Waspes, Hornets, Beetles, Snailes, Vipers, Snakes, Lizards, Scorpions and Efts or Nutes, unless from excessive putrefaction which the humidity of the air, our native heat being liquid and dull, hath caused inus, and the whole kingdome of France? Hence also proceeds the infirmity of our native heat, and the corruption of the blood and humors whereof we consist, which the rainy Southwind hath caused with its sultry heat. Wherefore in these last years I have drawn little blood, which hath not presently shewed the corruption of its substance by the black or greenish colour, as I have diligently observed in all such as I have bled by the direction of Physitians, either for prevention of future, or cure of present diseases. Whence it comes to passe that the fleshy substance of our bodies could not but be faulty both in temper and consistence; seeing that the blood whence it is generated had drawn the seeds of corruption from the defiled air. Whence it fell out, that the Wounds which happend with losse of substance could be scarse healed or united, because of the depraved nature of the blood. For so the Wounds and ulcers of these which are troubled with the Dropsie, whose blood is more cold or wholly wateriſh; so of Leprous persons, whose blood is corrupt, and lastly of all such as have their bodies replete with ill juice, or else are Cachectick, will not easily admit of cure. Yea assuredly if but the very part which is hurt swerve from its native temper, the Wound will not easily be cured. Therefore seeing all these things, both the putrefaction of the Air, and depraved humors of the body, and also the distemper of the affected parts conspired together to the destruction of the wounded, what marvail was it, if in these late civill warres, the Wounds which were for their quantitie small, for the condition of the wounded parts but little, have caused so many and grievous accidents and lastly death it self? Especially, seeing that the Air which encompasseth us, tainted with putrefaction corrupts and defiles the Wounds by inspiration and expiration, the body and humors being already disposed, or inclined to putrefaction. Now there came such a stink, which is a most assured sign of putrefaction, from these Wounds, when they were dressed, that such as stood by could scarse endure it, neither could this stink be attributed to the want of dressing, or fault of the Chirurgeon; for the Wounds of the Princes and Nobility stunk as ill as these of the common Souldiers. And the corruption was such, that if any chanced to be undrest for one day, which sometimes happened amongst such a multitude of wounded persons, the next day the Wound would be full of wormes. Besides also, which furthermore argues a great putrefaction of humors, many had abscesses in parts opposite to their Wounds, as in the left knee, when as the right shoulder was wounded; in the left arm, when as the right leg was hurt. Which I remember befell the King of *Navarre*, the Duke of *Nevers*, the Lord *Rendan* and divers others. For all men had nature so overcharged with abundance of vicious humors, that if it expelled not part thereof by impostumes to the habit of the body, it certainly otherwise disposed of it amongst the inner parts of the body; for in dissecting dead bodies, we observed that the Spleen, Liver, Lungs, and other Bowells were purulent, and hence it was that the patients by reason of vapours sent from them to the heart were troubled with continuall feavers. But the Liver and all the veinous parts being polluted, & so the generation of the laudable blood hindred, they languished for want of fitting nourishment. But when the Brain by vapours was drawn in to sympathize with the rest,

Fleſh quickly putrefies in maritime places.

In what bodies ulcers and wounds are not easily cured.

An argument of great putrefaction of the humors.

rest, they were molested with Ravenings and Convulsions. Wherefore if any thing succeeded unprosperously in so great malignancy of wounds, the Chirurgeon was not to be blamed, for that it were a crime to fight against God and the Air, wherein the hidden scourges of the divine justice lye hid. Therefore if according to the mind of the great *Hippocrates*, who commands to bring all contused Wounds to suppuration, that so they may be healed, we indeavoured to cure with such medicins Wounds made with Gunshot, and therefore contused; who can rightly be angry with us, if we performed it not so well, by reason of these putrefactions, gangrenes, and mortifications which proceeded from the corrupt Air, for all that we used not only suppuratives, but were oft-times forced to use other medicins; so long turning aside from the cure of the disease, untill we had orecome the symptomes which much indanger the Patient, and customarily happen upon such Wounds, as also upon those which are made with a sword or any other kind of weapon; as shall plainly appear in the following treatise, to which it now seems high time that we betake our selves.

All contused wounds must be brought to suppuration

CHAP. I. *A division of wounds drawn from the variety of the wounded parts, and the Bullets which wound.*

ALl Wounds which are made in mans body by Gunshot, whether simple or compound, are accompanied with contusion, dilaceration, distemper and swelling. I say, all these possess either the noble parts, or ignoble, the fleshy, nervous or bony, some whiles with rending and tearing asunder the larger vessells, sometimes without harming them. Now these Wounds are only superficiary, or else pierce deep and pass quite through the body. But there is also another division of these Wounds taken from the variety of the Bullets wherewith they are made. For some Bullets are bigger, some less, some between both, they are usually made of lead, yet sometimes of steel, iron, brass, tin, scarse any of Silver, much less of Gold. There arises no difference from their figure; for almost all kinds of Wounds of this nature are round. From these differences, the Chirurgeon must take his Indications what to do, and what medicins to apply. The first care must be, that he think not these horrid and malign symptoms, which usually happen upon these kinds of Wounds, to arise from combustion, or poyson carried with the Bullet into the wounded part, and that for these reasons we have formerly handled at large. But rather let him judg they proceed from the vehemency of the contusion, dilaceration and fracture, caused by the Bullets too violent entry into the nervous and bony bodies. For if at any time the Bullet shall only light upon the fleshy parts, the Wounds will be as easily cured, as any other Wound usually is, which is made with a contusing and round kind of weapon, as I have often found by frequent experience, whilst I have followed the wars, and performed the part of a Chirurgeon to many Noblemen and common Souldiers, according to the counsell of such Physitians as were there overseers of the cure.

A division of wounds from the variety of the wounded parts. From the difference of Bullets. Wounds made by Gunshot are usually round.

CHAP. II. *Of the signs of Wounds made by Gunshot.*

WOunds made by Gunshot are known by their figure, which is usually round; by their colour, as when the native colour of the part decayes, and in stead thereof a livid, greenish, violet or other colour succeeds; by the feeling or sense of the stroke, when in the very instant of the receiving thereof, he feels a heavy sense as if some great stone, or piece of timber, or some such other weighty thing had faln upon it; by the small quantity of bloud which issues out thereat, for when the parts are contused, within some small while after the stroak they swell up, so that they will scarse admit a Tent, whence it is that the blood is stopped, which otherwise would flow forth of the orifice of the Wound; by heat, which happens either by the violentness of the motion, or the vehement impulsion of the air, or the attrition of the contused parts, as the flesh and nerves. Also you may conjecture that the Wounds have been made by Gunshot, if the bones shall be broken, and the splinters thereof by pricking the neighbouring bodies cause defluxion and inflammation. But the cause that the Bullet makes so great a contusion is, for that it enters the body not with any points or corners, but with its round and spherical body, which cannot penetrate but with mighty force; whence it cometh to pass that the wound looks black, & the adjacent parts livid: hence also proceed so many grievous symptoms, as pain, Defluxion, Inflammation, Apostumation, Convulsion, Phrensie, Palsie, Gangrene and mortification, whence lastly death ensues. Now the Wounds do often cast forth virulent and very much stinking filth, by reason of the great contusion, and the rending and tearing of the neighbouring particles. A great abundance of humors flow from the whole body, and fall down upon the affected parts, which the native heat thereof being diminished, forsakes, and presently an unnaturall heat seises upon it. Hither also tend an universall or particular repletion of ill humors, chiefly if the Wounds possess the nervous parts as the joints. Verily neither a Stag with his horn, nor a flint out of a sling can give so great a blow, or make so large a Wound, as a Leaden or Iron Bullet shot out of a Gun, as that which going with mighty violence, pierces the body like a Thunderbolt.

Signs of wounds from their figure. From their colour. From the feeling the blow. From the bleeding. From the heat of the wound. Whence these wounds are so much contused.

CHAP. III. *How these Wounds must be ordered at the first dressing.*

THe Wound must forthwith be inlarged, unless the condition of the part resist, that so there may be free passage forth both for the *Sanies*, or matter, as also for such things as are farced, or otherwise contained therein; such as are pieces of their cloaths, bombast, linnen, paper, pieces of Mail or Armour, Bullets, Hail-shot, splinters of bones, bruised flesh and the like, all which must be plucked forth with as much celerity and gentleness as may be. For presently after the receiving of the Wound the pain and inflammation are not so great, as they will be within a short time after. This is the principall thing in performance of this work, that you place the Patient just in such a posture as he was in at the receiving of the Wound; for otherwise the various motion and turning

Strange bodies must first be pulled forth. The manner how to draw them forth.

ing of the Muscles will either hinder or straiten the passage forth of the contained bodies. You shall if it be possible, search for these bodies with your finger, that so you may the more certainly and exactly perceive them. Yet if the bullet be entred somewhat deep in, then you shall search for it with a round and blunt probe, lest you put the Patient to pain; yet oftentimes you shall scarce by this means find the Bullet. As it happened to the Marshall of *Brissac* in the siege of *Parpignan*, who was wounded in his right shoulder with a Bullet, which the Chirurgeons thought to have entered into the capacity of his body. But I, wishing the Patient to stand just in the same manner as he did when he received the Wound, found at length the place where the Bullet lay, by gently pressing with my fingers, the parts near the Wound, and the rest which I suspected; as also by the swelling, hardness, pain and blackness of the part, which was in the lower part of the shoulder near unto the eight or ninth spondill of the back. Wherefore the Bullet being taken forth by making incision in the place, the Wound was quickly healed, and the Gentleman recovered. You shall observe this, and rather beleeve the judgment of your fingers, than of your Probe.

CHAP. IIII. *A description of fit Instruments to draw forth Bullets and other strange bodies.*

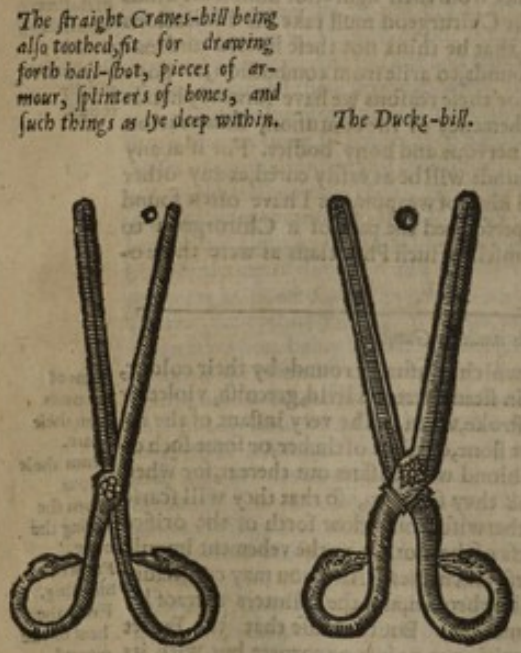
BOth the magnitude and figure of Instruments fit for drawing forth of Bullets and other strange bodies, are various according to the diversity of the incident occasions. For some are toothed, others smooth, others of another figure and bigness; of all which sorts the Chirurgeon must have divers in a readiness, that he may fit them to the bodies and Wound, and not the Wounds and bodies to his Instruments.

The Delineation of such like Instruments.

The crooked Cranes-bill, with teeth like a Saw.

The straight Cranes-bill being also toothed, fit for drawing forth hail-shot, pieces of armour, splinters of bones, and such things as lye deep within.

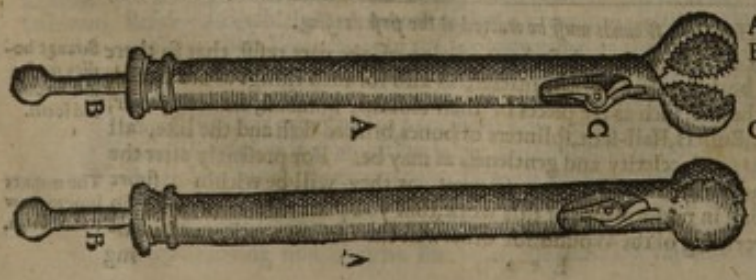
The Ducks-bill.



This Ducks-bill hath a large round and toothed cavity in the end, for so it more easily taketh hold of the Bullet when it lies amongst much Flesh.

A toothed Crowes-Bill.

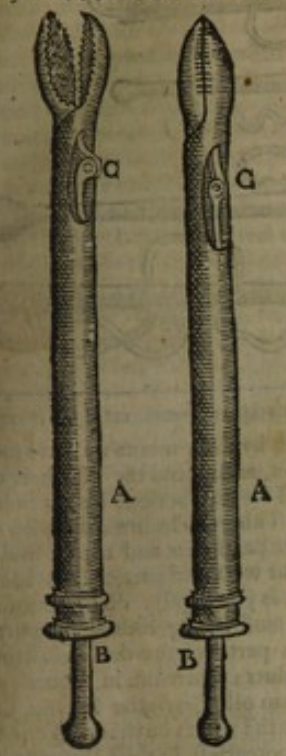
Another Instrument fit for drawing forth of Bullets, which may be tearmed a Catch-Bullet.



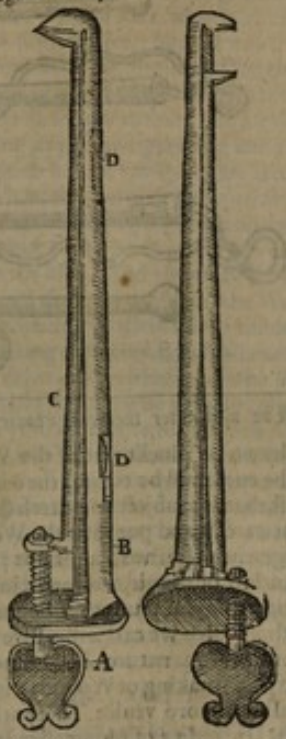
A. *Shews the Trunk.*
B. *Shews the rod, or string which opens and shuts the joint.*
C. *The joint.*

Another

Another Catch-Bullet called a Lizards-nose, made for drawing out of bullets which are somewhat flatted, by striking upon a bone.

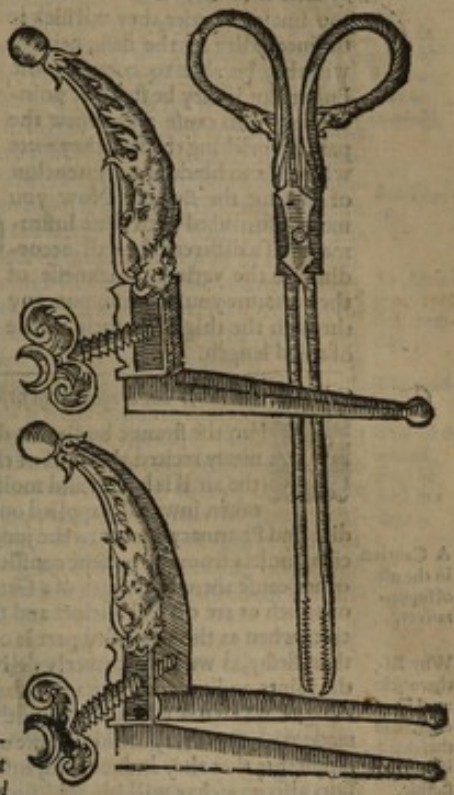


The Parrots-beak is made for drawing forth pieces of mail thrust into the flesh, or bones; and this is the figure thereof.



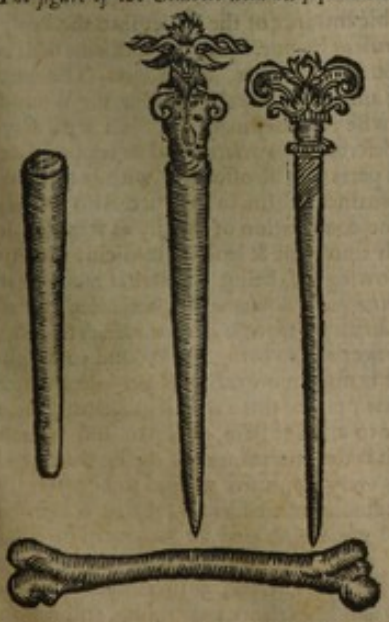
A. *Shews the screw pin.* B. *The hollowed part which receives, the round part noted with.* C. *Which is opened and and shut by the screw.* D. D. *Falls, or stayes, which govern the running branch.*

The Swans bill opens with a screw; you may with this dilate the Wounds, and so put in a straight Cranes-bill, as pincers to pluck forth strange bodies. The figure of both are here expresst.



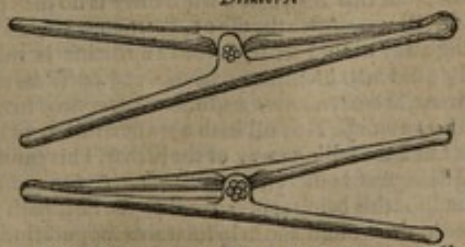
But if these strange bodies, especially bullets and hail-shot, be not too deep in the Wound, they may be taken forth with your Levatory, or else by the help of these Gimblets. These Gimblets are screwed into their pipes, or canes, and enter with their screwed points into the Bullets, if that they be of Lead or Tin, and of no harder metall; and so being fastened in them, bring them out with them.

The figure of the Gimblet with his pipe or cane.



Besides the Swans-bill which we lately mentioned, there are also other instruments fit to dilate and open the Wounds, therefore called Dilaters, by whose help the Wound may be held open, that so the hidden bodies may be seen; for when you press together the two ends of this Instrument, the other two open and dilate themselves. You may also use them in dilating divers other parts of the body, as the Nostrils, Fundament, and such like.

Dilaters.

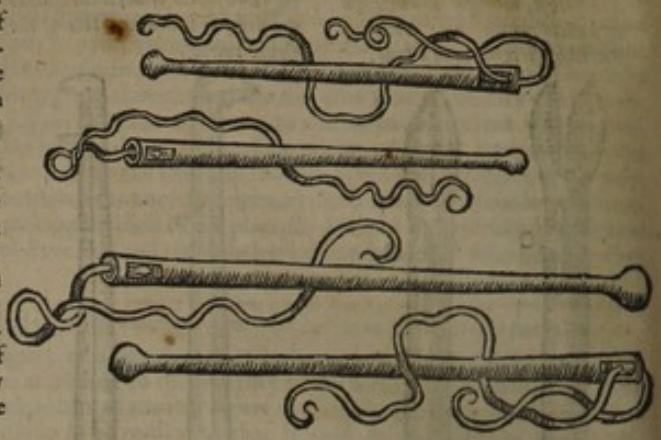


The Instruments which follow are called Seton needles, or Probes; whose use is, to draw through a flamula, so to keep the Wound open, that you may the better take forth any strange body. Besides also we use the same needles to search, or as it were to sound the deepness of the Wounds, and to find out the Bullets. For they cannot put one to much pain because they have smooth and round ends. So also all Probes wherewith we

What probes fit to search the se wounds.

search for Bullets, must have somewhat large, smooth and round ends. For seeing that the verges of the Wound meet together presently after the hurt, if the Probes be too smal or slender, they will slick in the inequality of the flesh, neither will they be able to come to the Bullet. But if they be sharp & pointed, they will cause and renew the pain by pricking the flesh they meet withall, & so hinder your intention of finding the Bullet; Now you must be furnished with these instruments of a different length, according to the various thickness of the parts; for you cannot put any through the thigh but such as are of good length.

Probes for to put flamulaes through a Wound withall.



CHAP. IX. *What dressing must first be used, after the strange bodies are pluckt or drawn out of the Wound.*

WHen the strange bodies are drawn or pluckt out of the Wound, by these means we have formerly recited, the chief of the cure must be to heal the contusion, and amend the distemper of the air if it be hot and moist, that is, subject to putrefaction. This shall be done by medicins taken inwardly, applied outwardly, and put into the Wound. Things to be inwardly used in diet and Pharmacy I leave to the judgment of learned Physitians; for the particular and topick medicins, (unless from the present constitution of the air, the condition of the wounded part, or from some other cause there be danger of a Gangrene) you must use suppuratives, as you usually do in contusions; such as are oil of Whelpes and that which we call a digestive; you must chiefly forbear suppuratives, when as the wounded part is of a nervous nature. For all nervous parts require dryer medicins than fleshy, as we have formerly delivered speaking of Wounds of the joints; wherefore in Wounds of the joints and nervous parts you shall use more venice Turpentine than oil. *Laurentius Iobertus* the Kings Physitian & Chancellour of the University of Mompelier, in a treatise which he writ of Wounds made with Gunshot, forbids the use of Escharoticks both actuall and potentiall, in these Wounds, if simple; for that they induce pain, inflammation, a feaver, Gangrene and other deadly symptomes. Besides also an eschar will hinder suppuration, which is to be desired in this kind of Wounds, that so the contused flesh may be severed from the sound, lest it be drawn to putrefaction by contagion. Which easily happens when an Eschar is drawn, as a bar over it, for then the excrementitious humor remains longer in the part, and the putredinous vapours hindred from passing forth, are encreased, and carryed from the lesser vessels to the bigger, and so over all the body. Wherefore, when you suspect putrefaction, letting alone suppuratives, use in the first place such things as resist putrefaction, as this following ointment. ℞ *pulver. alumin. rochæ, viridis æris, vitrioli romani, mellis rosat. an.* ℥ij. *aceti boni quantum sufficit, bulliant omnia simul secundum artem, & fiat medicamentum ad formam mellis.* This by reason of the heat and subtlety of the substance, hath a faculty to induce and attenuate the humors, as also to call forth the native heat drawn in & dissipated by the violent and forcible entrance of the Bullet into the body; furthermore also it corrects the venemous contagion of the virulent humor. Now this medicine shall be used, dissolved in Venegar or *aquæ vitæ*, and be put into the Wound with tents, or pledgets. The tents which shall be used at the first dressing must be somewhat long and thick, that by dilating the Wound, they may make way for application of other remedies; otherwise you may make injection with a syringe, that so it may penetrate the more powerfully. But this described *Ægyptiacum* shal be tempered according to the condition of the affected parts, for the nervous parts will be offended with it as being too acrid; but it may be qualified by admixture of oil of Turpentine & Saint Iohn-wort. Also we may well be without this *Ægyptiacum* when there is no such pestilent constitution of the air, as was seen in the late Civill wars. After the use of *Ægyptiacum* you shall with emollient & lenitive medicins procure the falling away of the Eschar, & such a medicine is this following oil, being somewhat more than warm. ℞ *Olei violati lib.* iiij. *in quibus coquantur catelli duo nuper nati, usque ad dissolutionem ossium, addendo vermium terrestrium, ut decet præparatorum,* lb. j. *coquantur simul lento igne, deinde fiat expressio ad usum, addendo terebinth. venet.* ℥iij. *aquæ vitæ* ℥j. This oil hath a wonderfull force to asswage pain, to bring the Wound to suppuration, & cause the falling away of the Eschar. This ensuing oil is made more easily. ℞ *olei seminis lini, & lilior. an.* ℥iij. *unguent. basilic.* ℥j. *liquefiant simul & fiat medicamentum*; put of this a sufficient quantity into the Wound; for this being applyed indifferent hot, hath power to asswage Pain, to soften and humect the orifice of the wound, and help forwards suppuration, which is the true manner of curing these kind of Wounds, according to the rule of *Hippocrates*, which wishes every contused wound to be presently brought to suppuration, for so it will be lesse subject to a Phlegmon; and besides, all the rent & bruised flesh must putrefie, dissolve and turn to quitture, that new and good flesh may be generated in stead thereof. *Laurentius Iaubertus* much commends this following medicine, of whose efficacy, as yet, I have made no triall. ℞ *pulver. mercur. bis calcinati,* ℥j. *adipis porci recentis, vel butyri recentis,* ℥viij. *Camphoræ in aqua vitæ dissolutæ,* ℥ij. *misce omnia simul, addendo tantillum olei liliorum, aut lini.* Experience taught him, and reason also shewes, that this kind of remedy is very commendable; for the powder of Mercury, if mixed with

A Caution in the use of suppuratives.

Why Escharoticks must be eschewed in these kinds, if they be simple.

Howan Eschar may cause putrefaction.

The discription of an *Ægyptiacum.*

How and when to temper this *Ægyptiacum.*

The oil of Whelpes a digestive, anodyne, and fit medicine to procure the falling away of an Eschar. *Lib. de ulcer.*

The faculties of the powder of Mercury.

a grosse and humecting matter, doth in a short space turn the bruised flesh into *pus*, without causing any great pain. For the Camphire, whether it be hot or cold, in temper, it much conduces to that purpose, by reason of the subtlety of the parts, whereof it consists. For by means of this quality the medicines enter with more facility into the affected bodies, and perform their parts; besides also Camphire resists putrefaction. Some drop into the Wound *aqua vitæ*, wherein they have dissolved some calcined vitriol. Which kind of remedy is not suppurative, but yet much resists putrefaction, so that we may use it with good success, when the weather is hot, moist, and foggie. But when the Wound is made very neer at hand, it cannot but be burnt by the flame of the powder; in which remedies used for burns, will be usefull, not omiting such as are fit for contusions. But for these parts which lye next the Wound, you shall not, unless at the first dressing, apply refrigerating and astringent things, but rather emollient and suppurative. For those things which have a refrigerating faculty, weaken the part, and hinder] suppuration. For astringents constipate the skin, which is the] cause, that the putrid vapours shut up and hindred from transpiration and passage forth, a gangrene and mortification easily seise upon the part. But if the contusion be great and diffuse it self more largely over the flesh, the part must be much scarified; that so the contused and concreat blood, and therefore subject to putrefaction, may be evacuated. But for these parts, which somewhat further distant from the Wound encompasse the contused flesh, they require refrigerating and strengthening medicins, so to hinder the falling down and setling of the humor in that part which is this ensuing medicine. ℞ *pul. boli. armen. sanguin. Dracon. Myrrhæ, an.* ℥j. *succi solan. sempervivi, portulac. an.* ℥ iß. *albumin* iiij. *ovorum. oxyrhodin. quantum sufficit; fiat linimentum, ut decet.* You may use this, & the like untill the suspected symptome be past fear. Neither must you have less care, of binding up and rolling the part, than of your medicins; for it doth not a little conduce to the cure, to bind it so fitly up as it may be without pain. The Wound at the beginning of the cure, must be dressed but once in 24 houres, that is, untill the Wound come to suppuration; but when the quitture begins to flow from it, and consequently the pain and feaver are encreased, it shall be dreſt twice a day, that is, every twelve houres. And when the quitture flowes more abundantly than usuall, so that the collection thereof is very troublesome to the Patient, it will be requisite to dresse it every 8 houres; that is, thrice a day. Now when as this abundant efflux is somewhat slaked, and begins to decrease, it will suffice to dresse it twice a day. But when the ulcer is filled with flesh, and consequently casts forth but little matter, it will serve to dresse it once a day, as you did at the first.

The force of calcined vitriol.

How wounds made by Gunshot may be combust.

Scarification.

An Astringent repelling medicine.

The binding up.

How oft the wound must be dreſt in a day.

CHAP. VI. *How you shall order it at the second dressing.*

AT the second and following dressings, unless you suspect putrefaction, and a Gangrene, you shall only put into the Wound some of the oils formerly described, adding to them the yolks of some egs and a little saffron; and use this medicin, untill the Wound come to perfect suppuration. Here you must note this, that these kinds of Wounds are longer before they come to suppuration, than other Wounds made by any other sort of weapon; both for that the bullet, as also the air which it violently carries before it, by much bruising the flesh, on every side, dissipates the native heat, and exhausts the spirits of the part. Which things hinder digestion, and often cause the matter to stink, as also many other pernicious symptomes. Yet most usually *pus* or quitture appears within three or four dayes, sooner and later according to the various complexion, and temperament of the Patients bodies, and the condition of the ambient air in heat and cold. Then by little and little you must come to deterſives, adding to the former medicin some Turpentine washed in Rose, Barly, or some other such like water, which may wash away the biting thereof. If the incompassing air be very cold, you may to good purpose, add some *aqua vitæ*; for by *Galens* preseript, we must not use hot medicins in winter, & less hot in summer. Then in the next place use deterſives, as ℞. *aquæ decoctionis hordei quantum sufficit, succi plantaginis, apii, agrimon. centaurei minoris, an.* ℥j. *bulliant omnia simul; in fine decoctionis adde terebinthinæ venetæ* ℥ iij. *mellis rosat.* ℥ ij. *farin. hordei* ʒ iij. *croci* ϑ j. Let them be all well mixed together and make a Mundificative of an indifferent consistence. Or ℞ *succi clymeni, plantag. absinth. apii, an.* ℥ ij. *tereb. venet.* ℥ iiij. *syrup. absinth. & mellis rosat. an.* ℥ ij. *bulliant omnia secundum artem, postea colentur, in colatura adde pulver. aloes, masticbes, Ireos Florent. farr. hord. an.* ʒ j. *fiat Mundificativum ad usum dictum.* Or else ℞. *terebinth. venet. lotæ in aq. rosat.* ℥ v. *olei rosat.* ℥ j. *mellis rosat.* ℥ iij. *myrrhæ, aloes, mastich. aristoloch. rotundæ, an.* ʒ i ß. *farr. hord.* ʒ iij. *misce.* Make a Mundificative, which you may put into the Wound with tents, but such as are neither too long, nor thick, lest they hinder the evacuation of the quitture and vapours, whence the wounded part will be troubled with erosion, pain, defluxion, inflammation, abscess, putrefaction; all which severally of themselves, as also by infecting the noble parts, are troublesome both to the part affected, as also to the whole body besides. Wherefore you shall put into the Wound no tents, unless small ones, and of an indifferent consistence; lest (as I said) you hinder the passing forth of the matter, or by their hard pressing of the part, cause pain, and so draw on malign symptomes. But seeing tents are used both to keep open a Wound so long, untill all the strange bodies be taken forth, as also to carry the medicins, wherewithall they are anointed: even to the bottom of the Wound. Now if the Wound be sinuous and deep, that so the medicin cannot by that means arrive at the bottom and all the parts thereof, you must do your business by injections made of the following decoction. ℞. *aq. hord. lib. 4. agrimon. centaur. minor. pimpinellæ, absinth. plantag. M.* ß. *rad. aristoloch. rotund.* ʒ ß. *fiat decoctio ad lib. j. in colatura expressa dissolve aloes hepatic.* ʒ iij. *mellis rosat.* ℥ ij. *bulliant modicum.* Inject some of this decoction three or four times into the Wound, as often as you dress the Patient; and if this shall not be sufficient to clense the filth, and wast the spongious, putrid and dead flesh, you shall dissolve therein as much *Ægyptiacum* as you shall think fit for the present necessity; but commonly you shall dissolve an ounce of *Ægyptiacum* in a pint of the decoction. Verily *Ægyptiacum* doth powerfully consume the proud flesh which lies in the capacity

Why wounds made by Gunshot are so long before they come to suppuration.

Why Turpentine must be washed. *Gal. lib.* 3. *Meth.* A detergent medicin.

Why tents must be neither too long nor thick.

When you must use injections.

An Injection.

The quantity of *Ægyptiacum* to be used in an injection.

pacity of the Wound; besides also it only works upon such kind of flesh. For this purpose I have also made triall of the powder of Mercury, and burnt Alum equally mixed together, and found them very powerfull, even almost as sublimate, or Arsenick, (but that these cause not such pain in their operation.) I certainly much wonder at the largeness of the Eschar which arises by the aspersion of these powders. Many Practitioners would have a great quantity of the injection to be left in the cavities of sinuous ulcers, or Wounds; which thing I could never allow of. For this contained humor causeth an unnatural tension in these parts, and taints them with superfluous moisture, whereby the regeneration of flesh is hindered; for that every ulcer as it is an ulcer, requires to be dryed, in *Hippocrates* opinion. Many also offend in the too frequent use of Tents; for as they change them every houre, they touch the sides of the Wound, cause pain, and renew other malign symptomes; wherefore such ulcers as cast forth more abundance of matter, I could wish rather to be dressed with hollow tents, like those I formerly described to be put into Wounds of the Chest. You shall also press a linnen boulster to the bottom of the Wound, that so the parts themselves may be mutually condensed by that pressure and the quitture thrust forth; neither will it be amiss to let this boulster have a large hole fitted to the orifice of the Wound and end of the hollow tent and pipe, that so you may apply a spunge for to receive the quitture, for so the matter will be more speedily evacuated and spent, especially if it be bound up with an expulsive ligature, beginning at the bottom of the ulcer, and so rapping it up to the top. All the boulsters and rowlers, which shall be applyed to these kinds of Wounds, shall be dipped in Oxycrate or red wine, so to strengthen the part, and hinder defluxion. But you must have a speciall care, that you do not bind the Wound too hard, for hence will arise pain, hindering the passage forth of the putredinous vapours and excrements, which the contused flesh casts forth; and also fear of an *Atrophia*, or want of nourishment, the alimentary juyces being hindered from coming to the part.

VVhy none of the injection must be left in the wound.

Hollow tents or pipes.

The manner of binding up the wound.

CHAP. VII. *By what means strange bodies, left in at the first dressing, may be drawn forth.*

IT divers times happens, that certain splinters of bones, broken and shattered asunder by the violence of the stroak, cannot be pulled forth at the first dressing, for that they either do not yeeld or fall away, or else cannot be found by the formerly described instruments. For which purpose this is an approved medicin to draw forth that which is left behind. ℞ *radic. Ireos Floren. panac. & cappar. an.* ℥ iij. *aristolech. rotund. manna, thuris, an.* ʒ j. *in pollinem redacta incorporentur cum melle rosar. & terebinth. venet. an.* ℥ ij. or ℞ *resin. pini ficcæ* ℥ iij. *punicis combusti & extincti in vino albo, radic. Ireos, aristolochiæ, an.* ʒ ß. *thuris* ʒ j. *squamæ æris,* ʒ ij. *in pollinem redigantur, incorporentur cum melle rosato, fiat medicamentum.*

Two causes that make strange bodies hard to be taken forth.

CHAP. VIII. *Of Indications to be observed in this kind of Wounds.*

THe ulcer being clensed and purged, and all strange bodies taken forth; natures indeavours to regenerate flesh, and cicatrize it, must be helped forwards with convenient remedies, both taken inwardly, and applyed outwardly. To which things we may be easily and safely carryed by indications drawn, first from the essence of the disease, then from the cause; if as yet present it nourish the disease For that which *Galen* sayes, *Lib.* 3. *Meth.* that no indication may be taken from the primitive cause and time; must be understood of the time past, and the cause which is absent. And then from the principal times of the disease, the beginning, increase, state, and declination; for each of these four require their remedies. Others are taken from the temperament of the Patient, so that no Chirurgeon need doubt, that some medicins are fit for cholerick, othersome for phlegmatick bodies. Hither refer the indication taken from the age of the Patient; also it is drawn from his diet, for no man must prescribe any slender diet to one who is alwayes feeding, as to him who is accustomed to eat once, or twice a day. Hence it is that a diet consisting only of *Panada's* is more fit for *Italians* than for *French* men; for we must give somewhat to custome, which is as it were another nature. Vocations and dayly exercises, are referred to diet, for other things befit Husbandmen & labourers, whose flesh is dense and skin hardened by much labour, than idle and delicate persons. But of all other, have diligent regard of that indication which is drawn from the strength of the Patient; for we must presently, (all else being neglected) succor the fainting, or decaying strength; wherefore if it be needfull to cut off a member that is putrefied, the operation must be deferred if the strength of the Patient be so dejected, that he cannot have it performed without manifest danger of his life. Also indication may be drawn from the incompassing air, under which also is comprehended that, which is taken from the season of the yeer, region, the state of the air and soil, and the particular condition of the present and lately by-past time. Hence it is we read in *Guido*, that Wounds of the head are cured with far more difficulty at *Paris*, than at *Avignion*; where notwithstanding on the contrary, the Wounds of the legs are cured with more trouble, than at *Paris*; the cause is, the air is cold and moist at *Paris*; which constitution seeing it is hurtfull to the brain and head, it cannot, but must be offensive to the Wounds of these parts. But the heat of the ambient air at *Avignion*, attenuates and dissolves the humors, and makes them flow from above downwards. But if any object that experience contradicts this opinion of *Guido*, and say, that Wounds of the head are more frequently deadly in hot countries; let him understand that this must not be attributed to the manifest and naturall heat of the air; but to a certain malign and venenate humor, or vapor dispersed through the air, and raised out of the Seas; as you may easily observe in those places of *France* and *Italy* which border upon the Mediterranean Sea. An indication may also be drawn from the peculiar temper of the wounded parts, for the musculous parts must be dressed after one, and the bony parts after another manuer. The different sense of the parts, indicates and requires the

The Indication which is drawn from the strength of the Patient is the chiefest of all other.

VVhy wounds of the head at *Paris*, and of the legs at *Avignion* are hard to be cured.

the like variety of remedies; for you shall not apply so acrid medicins to the Nerves and Tendons, as to the ligaments which are destitute of sense. The like reason also for the dignity and function of the parts needfull for the preservation of life; for oft-times wounds of the brain, or of some other of the naturall & vitall parts, for this very reason that they are defixed in these parts, divert the whole manner of the cure, which is usually and generally performed in wounds. Neither that without good cause, for oft-times from the condition of the parts, we may certainly pronounce the whole success of the disease; for wounds which penetrate into the ventricles of the brain, into the heart, the large vessels, the chest, the nervous parts of the midriffe, the liver, ventricle, small guts, bladder, if somewhat large are deadly; as also these which light upon a joynt in a body repleat with il humors, as we have formerly noted. Neither must you neglect that indication which is drawn from the situation of the part, and the commerce it hath with the adjacent parts, or from the figure thereof; seeing that *Galen* himself would not have it neglected. But we must consider in taking these forementioned Indications, whether there be a composition, or complication of the diseases; for as there is one and that a simple indication, of one and that a simple disease, so must the indication be various of a compound and complicate disease. But there is observed to be a triple composition, or complication of affects besides nature; for either a disease is compounded with a disease, as a wound, or a phlegmon with a fracture of a bone; or a disease with a cause, as an ulcer with a defluxion; or a disease with a symptome, as a wound with pain, or bleeding. It sometimes comes to pass, that these three, the disease, cause, and symptome, concur in one case or affect. In artificially handling of which, we must follow *Galens* counsell, who wishes in complicated and compounded affects, that we resist the more urgent; then let us withstand the cause of the disease, and lastly that affect, without which the rest cannot be cured. Which counsell must well be observed; for in this composure of affects, which distracts the Emperick; but on the contrary, the rationall Physitian hath a way prescribed in a few & these excellent words, which if he follow in his order of cure, he can scarse miss to heal the Patient. Symptomes truly as they are symptomes, yeeld no indication of curing, neither change the order of the cure; for when the disease is healed, the symptome vanishes, as that which follows the disease, as a shadow follows the body. But symptomes do oftentimes so urge and press, that perverting the whole order of the cure, we are forced to resist them in the first place, as those which would otherwise increase the disease. Now al the formerly mentioned indications may be drawn to two heads; the first is, to restore the part to its native temper; the other is, that the blood offend not either in quantity or quality; for when those two are present, there is nothing which may hinder the repletion, or union of wounds nor ulcers.

An indication to be drawn from the quick and dull sense of the wounded part.

Gal. lib. 7. Meth. & 2. ad Glauc.

Gal. lib. 7. Meth.

How and when we must take indication of curing from a symptome.

CHAP. IX. *What remains for the Chirurgeon to do in this kind of Wounds.*

THe Chirurgeon must first of all be skilfull and labour to asswage pain, hinder defluxions, prescribe a diet in these six things we call not naturall, forbidding the use of hot & acrid things, as also of wine; for such attenuateth humors and make them more apt for defluxion. Therefore at the first let his diet be slender, that so the course of the humors may be diverted from the affected part; for the stomach being empty and not well filled, draws from the parts about it, whereby it consequently follows, that the utmost and remotest parts are at the length evacuated; which is the cause, that such as are wounded, must keep so spare a diet for the next dayes following. Venery is very pernicious, for that it inflames the spirits and humors far beyond other motions; whereby it happens that the humors waxing hot, are too plentifully carried to the wounded and over heated part. The bleeding must not be stanched presently upon receiving of the wound, for by the more plentifull efflux thereof the part is freed from danger of inflammation and fulnes. Wherefore if the wound bleed not sufficiently at the first, you shall the next day open a vein, and take blood according to the strength and plenitude of the Patient; for there usually flows no great store of blood from wounds of this nature; for that by the greatnes of the contusion and vehemency of the moved air, the spirits are forced in, as also I have observed in those who have one of their limbs taken away with a Cannon bullet. For in the time when the wound is received, there flows no great quantity of blood, although there be large veins and arteries torn in sunder thereby. But on the 4, 5, 6. or some more dayes after, the blood flows in greater abundance, and with more violence, the native heat and spirits returning into the part. The belly must be so qualified, that he may have at the least one stool a day, either by nature, or Art; and if by Art, than rather with a Clyster than purging medicins taken by the mouth, for that the agitation of humors, chiefly in the first dayes of the disease, is to be suspected, lest we increase the defluxion falling down upon the wounded part. Yet *Galen* writes that both the evacuations are here needfull, that is, blood-letting and purging; though the Patient be neither plethorick, nor repleat with il humors. But the care hereof must be committed to the judgment of the learned Physitian; pain, if joyned with inflamation shall be mitigated, by anointing the parts neer unto the wound with *unguent. nutritum*, composed with the juyce of Plantain, Housleek, Nightshade, and the like. *Vnguentum Diacalcithios* described by *Galen* dissolved with vinegar, oil of Poppyes and Roses is of no less efficacy; nor *unguent. de bolo*, nor divers other things of the same faculty, though properly no anodynes, as those which are not hot and moist in the first degree, but rather cold, but yet not so as to have any narcotick faculty. Now these forementioned things asswage pain for that they correct the hot distemper, and stay the acrid and cholerick defluxions, whose violence is more than cold. After the use of repercussives, it will be good to apply this following cataplasm. ℞. *Micæ panis infusæ in lacte vaccino* ℔ j ß. *bullient. parum addendo olei violacei, & rosar. an.* ʒ iij. *vitellos ovorum nu.* iiij. *pulver. rosar. rub. flor. chamæm. & meliloti, an.* ʒ ij. *farin. fabar. & hordei an.* ʒ j. *misce, fiat cataplasma secundum artem.* Also in this case you may easily make a medicin, of bread crums boyled in Oxycrate and oil of Roses. The cure of Tumors if any associate the wound, may be

Why such as are wounded must keep a slender diet.

Why we must open a vein in such as are wounded by Gunshot.

Gal. Lib. 4. Meth. cap. 6.

Gal. Lib. 1. de comp. Med. secund. gen. c. 6.

An anodine and ripening Cataplasm.

be found in their proper place. Natures motion, whether to suppuration, or any such thing, must still be observed, and helped by the Physitian and Chirurgeon, as the ministers and servants thereof.

CHAP. X. *Of Bullets which remain in the body, for a long time after the Wound is healed up.*

VVhy Leaden Bullets lye in the body so many years without doing any harm.

LEaden Bullets lye in some parts of the body some whiles seaven, eight or more years, so that they neither hinder the agglutination of the Wound, neither doth any other symptome happen thereupon, as I have divers times observed; untill at length by the strength of nature forcing them, and their proper weightiness bearing them downwards, they shew themselves in some lower part, by their swelling or bunching forth, and so must be taken forth by the hand of the Chirurgeon. For they say lead hath a certain sympathy and familiarity with mans body, chiefly the fleshy parts thereof. Wherefore it neither putrefies it self, nor causeth the flesh to putrefie; besides it hath an excellent faculty in cicatrizing old ulcers. But bullets of stone, iron and of any other metall, are of another nature, for they cannot remain any long time in the body without hurt; for Iron will grow rusty, and so corrode the neighbouring bodies, and bring other malign symptomes. Yet a Leaden bullet cannot remain any long time in nervous, or noble parts without danger.

CHAP. XI. *How to correct the constitution of the air, so that the noble parts may be strengthened, and the whole body besides.*

Cordialls to strengthen the noble parts.

BUt because as we have formerly told you, there are some times wherein even small Wounds made by Gunshot prove deadly, not by their own fault, but the fault of the air; therefore also the Chirurgeon must have this care, that he correct the aire with all diligence, & reduce it to a certain quality and moderation of substance, and strengthen the noble parts and whole body besides, which may be performed by the following medicins, which are to be taken inwardly and applyed outwardly. In the morning three houres before meat let the Patient take some certain quantity as the Physitian shall think fit of the electuary *Diarrhodon Abbatis*, or *Aromaticum rosatum*, *triasantalon*, *hiamoschum*, *Letificans Galeni*, or some such other like. And you shall apply some such Epitheme as is here described to the heart and Liver. ℞ *aquæ rosar.* ℥iiij, *aquæ bugloss.* ℥ij. *coriandri præparati* ʒß. *caryophill. cortic. citri an.* ʒj. *sant. rub.* ʒß. *coralli utriusque* ʒß. *camphoræ* ℈j. *croci* ℈ß. *pulver. diarrhod. abbat.* ʒij. *theriacæ & Mithridatii an.* ℥ß. *pul. fio. chamæm. & melil. an.* ℥iij. *misce, fiat epithema.* Let it be applyed warm by dipping a scarlet cloath therein. You shall frequently put odoriferous and refrigerating things to the Patients nose, to strengthen the animall faculty, as; ℞ *aquæ rosar. & aceti boni an.* ℥iij. *caryophyllorum, nucis moschat. cinamomi conquassatorum, & Theriacæ Galeni, an.* ʒj. Let a linnen rag dipped herein, be now and then put to the Patients nose; for the same purpose he shall carry a Pomander about him, and often smell there. As ℞ *ros. rub. violar. an.* ʒiij. *baccarum myrti, juniperi, santal. rub. an.* ʒijß. *styracis calamit.* ʒij. *aq. rosarum quantum satis est: liquefiat simul cum ceræ albæ quod sufficit, fiat ceratum ad comprehendendos supradictos pulveres cum pistillo calido, & ducatur in pomum.* Or ℞ *rad. Ireos Florent. majoran. calam. aromat. ladani, benzoini, rad. operi, caryophyl. an.* ʒij. *Moschi gra.* 4. *fiat pulvis cum gummi tragacanth. quod sufficit.* Or else. ℞ *ladani puri* ℥j. *Benzoini* ℥ß. *styracis calamit.* ʒvj. *ireos Flor.* ℥ß. *caryophyll.* ʒiij. *majoran. ros. rub. calami aromat. an.* ʒß. *in pollinem redigantur omnia, & bulliant cum aqua ros. quantum sufficit; colentur, colata liquefiant cum justa ceræ albæ quantitate, styracis liquidæ,* ℥j, *fiat ad modum cerati, & cum pistillo fiat pomum, addita moschi* ʒj. Also you may corroborate the animall faculty by application of frontalls, as also procure sleep, and ease the pain of the head; as ℞ *aq. ros.* ℥ij. *olei ros. & papav. an.* ℥iß. *aceti boni,* ℥j. *trochis. de camphora,* ℥ß. *fiat frontale.* Linnen rags dipped herein may be applyed to the temples of the forehead, and often renewed; otherwise by their heat, dryness, and hardness, they will cause watching in stead of sleep. Neither must you in the mean time bind the head too hard, lest by intercepting and hindring the pulsation of the temporall Artery, you encrease the pain of the head. You shall make a fire, in the Patients chamber of odoriferous woods, as Iuniper, Bay-tree, the prunings or cuttings of Vines, Rosemary, and Orris roots. For the same purpose, you may sprinkle the floore with sweet water; if the Patient be able to undergoe such cost. As, ℞ *majoranæ, menthæ, radic. operi, calami aromat. salviæ, lavendulæ, fœnicul. thymi, staechad. flor. chamæm. melilot. satureiæ, baccarum lauri, & juniperi, an. M.* iij. *pulv. caryophyll. nucis Moschat. an.* ℥j. *aquæ rosar. & vitæ, an. lib.* ij. *vini albi boni & odorifici. lb.* x. *bulliant omnia in balneo Mariæ ad usum dictum.* You may also make perfumes to burn in his chamber, as thus; ℞. *carbonis salicis* ℥viij. *ladani puri* ℥ij. *thuris masculi, ligni & baccarum Iuniperi, an.* ℥j. *xyloaloes, benjoini, styracis calamit. an.* ℥ß *Nucis moschatæ, santal. citrin. an.* ʒiij. *caryophyll. styracis liquidæ, an.* ʒij. *zedoariæ, calami aromat. an.* ʒj. *gummi tragacanth. aquæ rosar. soluti, quod sit satis;* Make hereof perfumes in what fashion you please. For the rottennes and corruption of bones we will treat thereof hereafter in its due place.

Pomanders.

A cordiall Epithem.

Frontalls to cause rest, and strengthen the animall faculty.

A sweet water.

Perfumes to burn.

CHAP. XII. *Certain memorable Histories.*

HEre I thinke good for the benefit of young practitioners, to illustrate by examples the formerly prescribed Method of curing Wounds made by Gunshot. The famous and most valiant Count of Mansfelt, Governour of the Dutchy of *Luxembourg*, Knight of the order of Burgundy, comming to the aide of the French King, was at the battell of Moncontour, where in the conflict he received so great a Wound at the joint of the left arme with a Pistoll bullet, that the bones were shivered and broken in so many peeces, as if they had been laid upon an Anvill and struck with an hammer: hence proceeded many malign symptomes, as cruell and tormenting pain, inflammation, a feaver, an œdematous and flatulent tumor of the whole arm even to the fingers end, and a certain inclination to a Gangræne: which to resist, *Nicolas Lambert*, and *Richard Hubert* the Kings Chirurgeons, had

The malign symptomes which usually happen upon wounds made by Gunshot.

had made many and deep scarifications. But when I came to visit and dress him, by the Kings appointment, and had observed the great stench, and putrefaction, I wished that they would use lotions of *Ægyptiacum* made somewhat stronger than ordinary, and dissolved in vinegar and *aqua vitæ*, and do other things more largely spoken of in the chapter of a Gangræne. For the Patient had also a *Diarrhœa* or flux, whereby he evacuated the purulent, and stinking filth which flowed from his Wound. Which how it might come to pass we will show at large when we come to treat of the suppression of the Urine. For this seemed very absurd to many, because that if this purulent humor flowed out of the arm into the belly, it must needs flow back into the veins, be mixed with the blood, and by its pernicious and contagious passage through the heart and liver, cause exceeding ill symptomes, and lastly death. Indeed he often swounded by the ascent of the filthy vapours raised from the ulcer to the noble parts; which to resist, I wished him to take a spoonfull of *aqua vitæ* with some Treacle dissolved therein. I endeavoured to repress the œdematous and flatulent Tumor, possessing all the arme with stoups dipped in oxycrate, to which was put a little salt and *aqua vitæ*; these stoups I stayed and held to the part with double cloaths, sowed as strait as I could. Such a compression held the broken bones in their places, pressed their *Sanies* from the ulcers, and forced back the humors flowing to the part into the center of the body. If at any time I omitted this compression, the tumor was so encreased, that I was in a great deal of fear, left the native heat of the part should be suffocated. Neither could I otherwise bind up the arm by reason of the excessive pain which molested the Patient upon the least stirring of the Arm. There were also many Abcesses about his elbow and over all his arm besides. For the letting forth of whose matter I was forced, to make new incisions, which he endured very stoutly. At length I cured him with using a vulnerary potion, and by cleansing the ulcers, and correcting the putrefaction with *Ægyptiacum* dissolved in wine or honey of roses, and so poured into the ulcers, and repressing the growth of proud flesh, with the powder of burnt Alum, drying it after the detersion with liniments. Now this I can truly affirm and profess, that during the time of the cure, I took out above threescore splinters of bones, and those necessarily, amongst which there was one of the length of ones finger; yet by Gods assistance at length he became sound in all things, but that he could not put forth, or draw in his arm.

Matter may flow from the wounded limbes into the belly.

A briefe recitall of the manner of the cure.

Not long after by the Kings command I went to see *Charles Philip* of Croy, Lord of Auret, the Duke of Aschos brother, not far from Mounts a City of Henalt. He kept his bed seaven months by reason of a Wound made by a Bullet the space of three fingers above his knee. When I came to him, he was afflicted with these symptomes, intolerable pain, a continuall feaver, cold sweats, watchings, excoriation of the hippes by reason of his long lying upon them, his appetite dejected with much thirst. He oft sunk down as if he had the falling sickness, had a desire to vomit, and a continuall trembling or shaking so that he could not put one hand to his mouth without the assistance of the other: he swounded frequently by reason of the vapours ascending to the noble parts. For the thighbone was broken longwayes and sidewayes with many splinters of bones, whereof some were plucked out and others remained sticking fast in. He besides also had an ulcer in his groin which reached to the midst of his thigh, & many other sinuous ulcers about his knee. All the muscles of his thigh and leg were swoln with a flegmatick, cold and flatulent humor, so that almost all the native heat of those parts seemed extinct. All which things being considered, I had scarse any hope to recover him, so that I repented my coming thither. Yet at length putting some confidence in his strength, and prime of youth, I began to have better hopes. Therefore with his good liking, first of all I make two incisions, so to let forth the matter, which lying about the bone did humect the substance of the muscles. This had happy success, and drew out a great quantity of matter; then I with a syringe injected much *Ægyptiacum* dissolved in wine, and a little *aqua vitæ* into these incisions, so to restrain and amend the putrefaction, represse the spungie, loose and soft flesh, resolve the œdematous and flatulent tumor, asswage the pain, and stir up and strengthen the native heat almost oppress by the aboundance of excrementitious humors, so that it could scarsely assimilate any nourishment and adjoin it to the parts. Then I fomented the affected part with Sage, Rose-mary, Time, Lavander, Chamomile and Melilot flowers and Red-rose leaves boyled in white wine, and lye made of Oake-ashes, adding thereto as much salt and vinegar as I judged requisite. This fomentation did attenuate & draw forth the morbfiick humor. Now we used them long & often, so to wast the humor more by drying up and breathing thorow the passages of the skin, more thereof than fell into the part. For this same purpose, we ordained that he should use frictions with hot linnen clothes, and that these should be made from above downwards, from below upwards, and so on every side, and somewhat long withall: For a short friction drawes more humor into the part than it can resolve: I wished that each other day they should lay bricks heated hot in the fire about his leg, thigh, & soal of his foot; but they were to be somewhat quenched, and sprinkled with wine and vinegar, with a small quantity of *aqua vitæ*. Much watrish moisture by this moist heat, did sweat out of these parts, the tumor was lessened, and the native heat by little and little restored. Then stoups dipped in lye made of Oake-ashes, wherein Sage, Rosemary, Lavander, salt, and cloves, were boyled, some *aqua vitæ* added, were applyed thereto; but the rowlers were so gently, and artificially wrapped about, that he did easily endure them without any pain, and that with such happy success, that if they were omitted but for one day, the tumor became very great. But thick linnen boulsters were laid upon the lower cavities of the ulcers; that so the *sanies* or filth might be more easily pressed forth. But I had alwayes a speciall care that the orifices of the ulcers should be kept open with hollow Tents or pipes put therein: and sometimes this following cataplasm was applyed to resolve the tumor. ℞ *Far. hord. fabar. & orobi, an.* ℥vj. *mellis com. & tereb. an.* ℥ij. *flo. chamæm. melil. & ros. rub. an.* ℥ß. *pulv. rad. Ireos, Flor. cyper. Mast. an.* ℥iij. *oxymel. simp. quantum sufficit; fiat cataplasma ad formam pultis satis liquidæ.* And *emplastrum de Vigo* without Mercury was applyed thereto, whereby the pain was much asswaged, and the tumor lessened: yet were they not applyed before the parts were throughly heated by the fomentation, frictions, and evaporations; for

Horrid symptome occasioned by a wound made by Gunshot.

Incisions wherefore made.

Wherefore I used fomentations.

Mixed or round frictions, as they terme them.

A medicated Lye.

A discussing Cataplasme.

otherwayes

otherwayes this Emplaster could never have been activated, by reason of the excessive coldness of the affected parts. Neither did we omit catagmatick powders, fit for the taking, and drawing forth of broken bones. He used a vulnerary potion for 15 dayes. Also besides the particular frictions of the affected parts, I appointed other generall frictions of the whole body, which was become very lean; for by these, blood together with the spirit was drawn to the parts, and the acrid, and fuliginous vapours were breathed forth. To conclude, his feaver and pains being asswaged, his appetite restored, by feeding plentifully upon good meats according to his strength, he in a short time became more lusty; and lastly by the singular mercy of God, recovered his health perfectly, but that he could not very well bend his knee. I thought good to recite these things, not to glory or brag of the happy successe of those Patients, which have recovered by my means, and the favour of God; but that thus I may more fully and perfectly by familiar examples instruct young practitioners, in the operations of Chirurgery.

CHAP. XIII. *An Apologie concerning wounds made by Gunshot.*

The occasion of writing this Apologie.

THere lately came to my hands a book written by a certain Physitian, whereby he endeavours to disprove and overthrow, that which I have hitherto writ, of the cure of wounds made by Gunshot. Assuredly if there were no other harm, but the loss of my credit ensuing thereon, I would willingly hold my peace, and stop his mouth by modest silence. But seeing the safety of so many men, lyes upon the judgement of this point, I have thought good to withstand this errour, lest it, to the great destruction of mankind, spread and diffuse it self any further.

The chiefe heads of our adversaries Treatise.

The use (saith he) of suppurative medicins, have killed many who have been but lightly wounded with Gunshot, but acrid medicins, as *Ægyptiacum*, have killed more. Neither is the counsell of *Hippocrates* to be observed in curing this sort of wounds, who bids that every contused wound be brought to suppuration. For seeing this is a new kind of wound, it requires new, and not anciently used medicines. Now the temper of the air changed from the naturall constitution ought not to indicate change of medicines; but much lesse must thunder, and lightning be compared to the shooting of Great Ordinance. These are the chief heads of this his book, which because they dissent from the truth, and these things I have formerly delivered, I have thought good here to confute. First, seeing Leaden Bullets which

All wounds made by Gunshot are contused.

are usually shot out of Guns are round, obtuse and weighty, they cannot wound the body without contusion and attrition; Now no contusion can be cured without suppuration, not only according to the opinion of *Hippocrates*, but also of *Galen* and all others who have written of Physick. Neither must we invent new remedies, for these new kinds of wounds; for the lawes of the sacred and divine Art of Physick are not obnoxious to change, nor subject to the humor of men or times, as the decrees of Kings and Emperours are. For these are stablished with immutable necessity, which constancy neither consuming time, nor age, nor tyranny can pervert. Wherefore neither they who with great praise are Physitians to Kings and Princes, I mean *Joubert* and *Potallus*, think it lawfull for them to depart from the rules of *Hippocrates*. And this they not only do and follow in curing and doing the works of Art, but much and highly commend, confirm and propound to be diligently observed by all, in their books which they have published concerning the cure of these kinds of wounds. And yet these Physitians are such, as dayly conversant in Armies and Kings houses have healed and dayly cure as many wounded by Gunshot as this Physitian our Antagonist hath seen in all his life. Neither only do these whom I have named thus cure these wounds, but almost all that dresse such kind of wounds do the like, so that if there be nothing which may hinder, or indicate to the contrary, they presently apply suppuratives.

A suppurative medicine of tryed efficacy.

And I wonder that he hath not observed how his neighbour *Doublet* the Emperick cures desperate wounds of this nature, with no other than a suppurative medicine, composed of Lard, the yolk of an Egge, Turpentine and a little Saffron. In the year 1538. there was at *Turin* whilest I was Chirurgeon there to the Marshall of *Montejan* the Kings Lieutenant Generall in *Piemont* a certain Chirurgeon wondrous famous for curing these wounds, and yet he used nothing else but the oil of Whelpes, (the description whereof I at length obtained of him with much intreaty and expence) and he used it not scalding hot, as some have imagined, but powred it scarse warm into their wounds, and so did mitigate their pain, and happily bring them to suppuration. Which afterwards almost all Chirurgeons, after they had got the description hereof, when I first published this Work, have used and daily doe use with happy successe.

The force of *Ægyptiacum* against putrefaction.

But in contemning and condemning *Ægyptiacum*, I think he hath no partaker; seeing there as yet hath been found no medicine more speedy and powerfull to hinder putrefaction, if beginning; or correct it, if present. Now these wounds often degenerate into virulent, eating, spreading, and maligne ulcers, which cast forth a stinking and carion-like filth, whence the part gangrenates, unless you withstand them with *Ægyptiacum* and other acrid medicins, being greatly approved by the formerly named Physitians and all Chirurgeons. But (saith he) this unguent is poysonous, and therefore hath been the death of many who have been wounded by Gunshot. Verily if any diligently enquire into the composition of this ointment, and consider the nature of all and every the ingredients thereof, he shall understand that this kind of Unguent is so far from poyson, that on the contrary it directly opposes and resists all poyson and putrefaction which may happen to a fleshy part, through occasion of any wound.

The force of the air in breeding and augmenting diseases.

It is most false and dissonant from the doctrine of *Hippocrates* to affirm, that the seasons of the year swerving from the Law of nature, and the air, not truly the simple and elementary, but that which is defiled and polluted by the various mixture of putrid and pestilent vapours, either raised from the earth, or sent from above, make not wounds more malign and hard to cure at some times than they are at othersome. For the air either very hot, or cold, drawn into the body by inspiration or transpiration, generates a condition in us like its qualities. Therefore why may it not, when defiled with

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the putredinous vapours of bodies lying unburied after great battails, and shipwracks of great Armadoes, infect with the like quality our bodies and wounds?

In the year 1562. when the civill wars concerning Religion first begun in *France*, at *Pene* a Castle lying upon the River *Lot*, many slain bodies were cast into a Well, some hundred cubits deep, so stinking and pestilent a vapour arose from hence some two months after, that many thousand of people dyed all over the Province of *Agenois*, as if the Plague had been amongst them, the pernicious contagion being spread twenty miles in compass; which none ought to think strange, especially seeing the putrid exhalations by the force of the winds may be driven and carried into divers and most remote regions, dispersed like the seeds of the Pestilence; whence proceeds a deadly corruption of the spirits, humors, and wounds, not to be attributed to the proper malignity, or perverse cure of wounds, but to be the fault of the air. Therefore *Francis Daleschampe* in his *French* Chirurgery, in reckoning up these things which hinder the healing of Ulcers, hath not omitted that common cause which proceeds from the air defiled or tainted with the seeds of the pestilence. For he had learnt from his Master *Hippocrates* that the mutations of times chiefly bring diseases, and he had read in *Guido*, that this was the chief occasion, that wounds of the head at *Paris*, and of the legs at *Avignion*, were more difficultly healed. Lastly, even Barbers and such as have least skill in Chirurgery know, that wounds easily turn into a Gangrene in hot and moist constitutions of the air. Wherefore when the wind is southerly, the Butchers will kill no more flesh than to serve them for one day. I have formerly declared the malignity of the wounds occasioned by the air in the siege of *Roven*, which spared none, no not the Princes of the blood, who had all things which were requisite for their health. Which caused me, made at length more skilfull by experience, to use *Vnguentum Ægyptiacum* and medicins of the like faculty in stead of suppuratives, to wounds during all that season, that so I might withstand the putrefaction and Gangrene which so commonly assailed them. But if the various motion of the stars, can by their influx send a Plague into the air, why then may it not by depravation of their qualities infect, and as by poysoning corrupt both wounds and wounded bodies obnoxious to their changes and that of the air? We learnt long since by experience, that all pains but principally of wounds, grow worse in a rainy and moist season, specially because in that southerly constitution the air replete with thick and foggy vapours, causes the humors to abound in the body, which forthwith easily fall upon the affected parts, and cause increase of pain. But saith our Adversary, in the battell at *Dreux*, and at S. *Dennis* which were fought in winter, there dyed a great number of men who were wounded by Gunshot: This I confess is true, but this I deny, that it was occasioned by applying suppuratives; or corrosives, but rather by the vehemency and largeness of their wounds, & the spoil the bullet made in their members, but above all by reason of the cold. For cold is most hurtfull to wounds and ulcers, (as *Hippocrates* testifies) it hardens the skin and causes a Gangrene. If this my Gentleman had been with me in the siege of *Metz*, he might have seen the Legs of many souldiers to have rotted, and presently taken with a Gangrene to have faln away, by the only extremity of cold; if he will not beleeve me, let him make tryall himself; and go in winter to the Chappell at Mount *Senis* one of the Alpine hills, where the bodies of such as were frozen to death in passing that way are buried, and he shall learn and feel how true I speak. In the mean time I think it fit to confute the last point of his reprehension.

A History. *Hip. Aph. 1. sect. 3.* In cur second discourse. The power of the stars upon the air and our bodies. *Aphor. 20. sect. 5.*

He cavills for that I compared Thunder and Lightning with the discharging peeces of Ordnance. First he cannot deny but that they are alike in effects. For it is certain that the flame arising from Gunpowder set on fire, resembles Lightning; in this also that you may see it before you hear the crack or report. I judg for that the eye almost in a moment perceives its objects; but the ear cannot but in some certain space of time, and by distinct gradations. But the rumbling noise is like in both, and certainly the report of great Ordnance may be heard sometimes at forty miles distance, whilst they make any great battery in the besieging of Cities. Besides also, Iron Bullets cast forth with incredible celerity by the fired Gunpouder, throw down all things with a horrid force, and that more speedily and violently by how much they resist the more powerfully by their hardness. They report that Lightning melts the mony not hurting the purse; Now many by the only violence of the air agitated and vehemently moved by shooting a peece of Ordnance, as touched with Lightning have dyed in a moment, their bones being shivered and broken, no sign of hurt appearing in the skin. The smell of Gunpouder when it is fired, is hurtfull, firy and sulphurous, just like that which exhales or comes from bodies killed with Lightning. For men do not only shun this smell, but also wild Beasts leave their Dens if touched with Lightnings. Now the cruelty of great Ordnance makes no less spoil amongst buildings, nor slaughter amongst men and beasts, than Lightnings do, as we have formerly shown by examples, not only horrid to see, but even to hear reported, as of Mines, the Arcenall of *Paris*, the City of *Malignes*. These may seem sufficient to teach, that thunder and lightning have a great similitude with the shooting of great Ordnance, which notwithstanding I would not have a like in all things. For they neither agree in substance, nor matter, but only in the manner of violent breaking asunder the objects.

The similitude between Thunder and great Ordnance, maintained.

Now let us see and examin what manner of cure of wounds made by Gunshot our adversary substitutes for ours. For he would have suppuratives used and applyed, yet such as should not be hot & moist in quality, or of an Emplastick consistence, but hot and dry things. For (saith he) here is not the same reason as in Abscesses, where the Physitian intends nothing but suppuration. But here because a contusion is present with the wound, this requires to be ripened with suppuratives, but the wound to be dryed.

Our adversaries method, and manner of cure reproved.

Now to answer this objection, I will refer him to *Galen*, who will teach him the nature of suppuratives; from whom also he may learn that great regard is to be had of the cause and more urgent order in the cure of compound diseases; then would I willingly learn of him, whether he can heal a wound made by Gunshot, not first bringing that which is contused to perfect maturity. If he affirm he can, I

Gal. lib. 9. simpl. 19. Method.

will be judged by whatsoever Practitioners he will, to judg how obscure these things are. Whereby you may the better understand there is nothing more commodious than our *Basilicon* and oil of Whelps to ripen wounds made by Gunshot, if so be that putrefaction, corruption, a Gangrene or some other thing do not hinder. Then would he have *Oxycrate* poured into these wounds to stay their bleeding, which if it cannot so be stayed, he would have a medicin applyed consisting of the white of an Egge, Bole Armenick, oil of Roses and salt. But I leave it to other mens judgment, whether these medicins have power to stay bleeding if put into the wound; certainly they will make it bleed the more. For vinegar seeing it is of a tenuious substance and biting, it is no doubt but that it will cause pain, defluxion and inflammation. To which purpose I remember I put to stanch bleeding, for want of another remedie, a medicin wherein was some Vinegar, into a wound received by a Moor, an attendant of the Earl of *Roissy*, hurt with a Lance, run through his arm before *Bologne* by an *English* horseman. But he comes again to me a little after, complaining and crying out that all his arm burnt like fire; wherefore I was glad to dress him again, and put another medicin into his wound, and laid an astringent medicin upon the wound, but poured it not therein. And then above all other remedies he extols his Balsam composed of oil of Wax, and Myrrh beaten together with the white of an Egge; which he saith is equall in operation to the naturall Balsam of *Peru*. For he affirms that this hath a faculty to consume the excrementitious humidity of wounds, and so strengthens the part that no symptom afterwards troubles them. Yet he saith, this doth not so well heal and agglutinate these wounds, as it doth others which are cut. Verily it is ridiculous to think that contused wounds can be healed after the same manner as simple wounds may, which only require the uniting of the loosed continuity.

Vinegar put into a wound doth not stay but causes bleeding. A History.

Balms are fit to heal simple but not contused wounds.

Therefore neither can these Balsams be fit remedies to heal wounds made by Gunshot, seeing by reason of their dryness they hinder suppuration, which unless it be procured the Patient cannot be healed. Wherefore such things ought not be put into wounds of this nature, before they be ripened, washed and clensed from their filth. Yet can I scarse conceive, where we shall be able to find out so many Chymists which may furnish us with these things sufficiently to dress so many wounded souldiers as usually are in an Army, or whence the souldiers have sufficient means to bear the charge thereof. Also that which he saith is absurd, that these Balsams must be put into the wounds without Tents; and presently forgetting himself, he saith, it will not be amiss, if there be a little and slender Tent put into the wound, which may only serve to hinder the agglutination thereof. But how can these Balsams come to the bottomes of wounds without Tents, when as it is their chief property to carry medicins even to the innermost parts of the wounds, and alwayes keep open a free passage for the evacuation of the quitture? But it is not worthy, that after he hath rejected *unguentum Ægyptiacum*, he nevertheless bids to apply it, from the beginning untill the contusion come to perfect maturation, dissolving it in a decoction of the tops of wormwood, S. *John Wurt*, the lesser Centory and Plantain, and so injecting it into the wound. Besides also a little after he gives another way of using it, which is, to boil a quantity of Hony of Roses in plantain water, carefully skimming it, untill it be boiled to the consistence of Hony, and then to add as much *Ægyptiacum* thereto, and so to make an ointment most fit to bring these wounds to suppuration. But I leave it for any skilful in Chirurgery to judg, whether such medicins can be suppuratives, or whether they be not rather deterfives. Last of all he writes, that these wounds must be dresst but every fourth day. And if there be a fracture of the bone joyned with the wound, then to move nothing after the first dressing untill the eighth day after; then presently in another place he saith, it will be good, and expedient, to drop ten or twelve drops of the formerly described Balsam every day into the wound. Verily such doctrin which neither agrees with its self nor the truth, cannot but much pusle a Novice and young Practitioner in Chirurgery, who is not yet in versed the Art, or the operations thereof.

Ægyptiacum how soever made is a clenser, not a suppurative.

CHAP. XIIII. *Another Apologie, against those who have laboured with new reasons to prove that wounds made by Gunshot are poysoned.*

The occasion of this Apology.

SOme few months agone, I visited a Patient together with some learned Physitians and skilfull Chirurgeons. Now they, as it oft-times happens, in way of discourse, begun to argue of the condition & quality of wounds made by Gunshot, & indeavoured to prove that they might be poysoned by five reasons. Not truly through the occasion of the Gunpouder, for they all confessed that it was free from poyson, whether you have regard to its essence, or to its composition; but by the Bullet, into which the poyson may be transfused and incorporated. The first reason is, that Lead seeing it is of a rare and spongious nature, which the easiness of melting and softness argues, is very fit to drink and soak in what liquors so ever you please. But me thinks this conclusion is very weak; for in all mixtures made by Art, such as this is whereof we speak, there are two things to be considered; that is to say, the matter of the things which enter into the mixture, and the form: for the matter, such bodies must be either liquid, or soft, or friable; and lastly such as may be broken and divided into small particles, that so they may easily in all parts concur and be conjoyned and united. But for their form, there ought to be a certain affinity, consent and sympathy. You may perceive this by water and oil; for each of them though of a liquid substance, and such as may easily be mixed with divers other things, yet cannot they be mixed the one with the other by reason of their antipathy of forms. For thus gold and silver are so agreeing with lead, that as oft as they are molten lead is mixed with them. But brass shuns lead as much as gold and silver fly tin and white lead. If therefore brass and lead being melted cannot be mixed together, though contained under the same *Genus*, and common nature of Metalls; how then can it be commixt with another thing distinct in the whole kind, much more in *specie*, and form, to wit, poyson? Their second reason is this; Iron, say they, which is more dense,

The reason of our adversaries that the Bullets may be poysoned, set down and confuted.

denſe, ſolid, and leſs porous, may receive ſome venenate ſubſtance and quality, as the Arrows of the Ancients which were dipped in poyſon, teſtifie; therefore muſt Lead much more be capable thereof. I anſwer, that the ſurface of Iron may be poyſoned, but not the inner part or ſubſtance by mixture therewith. But here the queſtion is of union, but not of anointing or inunction. The third reaſon is thus framed; though (ſay they) lead caſt off and purges it ſelf from the droſs and unpure parts, yet that is no argument that it will not commix, or ſoak it ſelf in ſome ſtrange liquor or body; for thus Steel, being the moſt ſolid Iron, receives the temper which hardens it by the artificial pouring upon it or quenching it in liquors contrary thereto in their whole kind. I anſwer, that Steel admits into it by that quenching and tempering, none of the juyces or liquors wherewith it is watered or quenched. For if that were neceſſary, it might be better & more eaſily performed, when the metall is firſt caſt, than when it is beaten into plates or bars; which anſwer ſhal ſerve to confute their fourth reaſon; wherin they ſay, that bullets may be made ſo poyſonous by the commixture of the juyces of Muncks-hood, Oleander, Crow-foot, and other ſuch like things which in their whole ſubſtance are contrary to ours, that the wound wch is made with them cannot but be poyſoned. But I on the contrary affirm, that mixture is only of theſe things, which may not only be put, but alſo ſtick thereto, & be mutually united but how can water or any other liquid juice ſo much as only ſtick to lead, as that which is a ſolid & firm body, it is ſo far from being united, therewith? You may give more certain judgment hereof by experience, than by reaſon; wherefore let melted lead be put into the foreſaid juices or the like; then when the lead is cold, weigh each of them ſeverally and you ſhal find, that both of them retain the ſame weight they formerly had. Which is a moſt certain argument that neither the lead hath mixed or united it ſelf with the juices, nor the juices loſt any part of their ſubſtance. Their fifth reaſon is thus; A bullet ſhot out of a Gun againſt ſome hard ſtone, grows not ſo hot, but that you may preſently without any harm take it up in your hand. Therefore it is falſe, that the poyſon commixt & united with the bullet can be diſſipated by the fire and flaſh of Gunpouder. The anſwer to this objection is eaſie. For when we ſay, that although the Bullet may be infected by poyſon perfectly commixt with the lead, yet all the force of the poyſon would be diſſipated by the fire; we would have you thus to underſtand us, that we do not mean this of that fire which is made by the pouder at the diſcharging of the Peice, but of that by force whereof the molten lead is mixed and conjoined with the venenate juice, ſo to make one of many. For this fire exerciſing its force upon the venenate juices hindered by the intercourſe of no *Medium*, and that for ſome ſpace of time, and not for an inſtant, it may, if not conſume, yet much weaken their ſtrength. If there be any, who wil not be ſatisfied by theſe reaſons, let him conſult, & read *Mathiolus*. There are (ſaith he) ſome of theſe later times wholly ignorant of things, who (if we may ſay the the truth) have been ſo madly fooliſh, that they ſaid it was fit and requiſite to put Treacle and Mithridate and ſuch like antidotes amongſt gold and ſilver that was melted to make cups, that ſo receiving the faculties of the Antidote they might reſiſt poyſon. But how abſurd and ridiculous their opinion is, let them judg (for it needs no clearer reproof) who have but a little knowledg in naturall things, but chiefly in metalls. Theſe are my reaſons, theſe the authorities of men excelling in learning & judgment, that confirm me in my ancient & former opinion, that wounds made by Gunſhot do not partake of any venenate quality.

In præfat. 6 Diſcor.

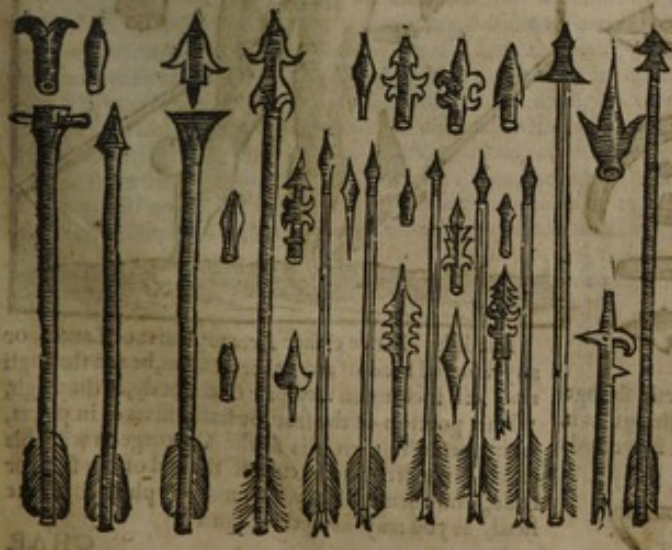
CHAP. XV. *How wounds made by Arrows differ from ſuch as are made by Gunſhot.*

Wounds made with Arrows and ſuch like things, are often without contuſion. But are oft-times poyſoned.

WOunds made by arrows and bolts ſhot out of Croſs-bows and ſuch like things, differ chiefly in two things, from theſe which are made by gunſhot. The firſt is, for that they are oft-times without contuſion, which the other never are. The other is, for that they oft-times are poyſoned. In both theſe reſpects, their cure is different from the other. But the cure of theſe wounds made by arrows is different in it ſelf, by reaſon of the variety and divers ſorts of Darts or Arrows.

CHAP. XVI. *Of the diverſities of Arrows and Darts.*

The figure of divers ſorts of Arrows.



The differences of Arrows.

ARrows and Darts are diſferent amongſt themſelves both in matter and in form or figure, in number, making, faculty or ſtrength; In matter, for that ſome of them are of wood, ſome of reeds, ſome are blunt headed, others have piles or heads of iron, braſs, lead, tin, horn, glaſſe, bone. In figure, for that ſome are round, others cornered, ſome are ſharpe pointed, ſome barbed, with the barbs ſtanding either to the point, or ſhafts, or elſe acroſſe, or both wayes, but ſome are broad and and cut like a Chiſſell. For their bigneſſe, ſome are three foot long, ſome leſſe. For their number, they differ in that, becauſe ſome have one head, others more. But they vary in making, for that ſome of them

In matter.

In figure.

In bigneſſe.

In number.

In making.

In force. have the shaft put into the head, others the head into the shaft; some have their heads nailed to the shaft, others not, but have their heads so loosly set on, that by gentle plucking the shaft, they leave their heads behind them, whence dangerous wounds proceed. But they differ in force, for that some hurt by their Iron only, others besides that, by poyson, wherewith they are infected. You may see the other various shapes represented to you in the preceding Figure.

CHAP. XVII. *Of the difference of the wounded parts.*

THe wounded parts are either fleshy or bony; some are neer the joints, others seated upon the very joints; some are principall, others serve them; some are externall, others internall. Now in wounds where deadly signs appear, 'tis fit you give an absolute judgment to that effect; lest you make the Art to be scandalled by the ignorant. But it is an inhumane part, and much digressing from Art, to leave the Iron in the wound; it is sometimes difficult to take it out, yet a charitable and artificiall work. For it is much better to try a doubtfull remedy, than none at all.

You must not leave the weapon in the wound.

CHAP. XVIII. *Of drawing forth Arrows.*

The manner of drawing forth Arrows, and such weapons. YOu must in drawing forth Arrows shun incisions and dilacerations of Veins and Arteries, Nerves and Tendons. For it is a shamefull and bungling part to do more harm with your hand, than the Iron hath done. Now Arrows are drawn forth two wayes, that is, either by extraction, or impulsion. Now you must presently at the first dressing pull forth all strange bodies, which that you may more easily and happily perform, you shall set the Patient in the same posture, as he stood when he received his wound; and he must have also his Instruments in a readinesse, chiefly that which hath a slit pipe and toothed without, into which there is put a sharpe Iron style, like the Gimblets we formerly mentioned for the taking forth of Bullets; but that it hath no screw at the end, but is larger and thicker, so to widen the pipe, that so widened it may fill up the hole of the Arrows head whereinto the shaft was put, and so bring it forth with it, both out of the fleshy as also out of the bony parts, if so be that the end of the shaft be not broken, and left in the hole of the head. That also is a fit Instrument for this purpose, which opens the other end toothed on the outside, by pressing together of the handle. You shall find the Iron or head that lies hid by these signs, there will be a certain roughnesse and inequality observable on that part if you feel it up and down with your hand; the flesh there will be bruised, livid, or black, and there is heavinesse and pain felt by the Patient both there and in the wound.

A delineation of Instruments fit to draw forth the heads of arrows, & darts, which are left in the wound without their shafts.

A hooked Instrument fit for to draw forth strange bodies, as pieces of Male, and such other things as it can catch hold of, which may also be used in wounds made by Gunshot.

But if by chance either Arrows, Darts or Lances, or any winged head of any other weapon, be run through and left sticking in any part of the body, as the thigh, with a portion of the shaft or staffe slivered in pieces, or broken off; then it is fit the Chirurgeon with his cutting mullets should cut off the end of the staffe or shaft, and then with his other mullets pluck forth the head, as you may see by this Figure.

CHAP.

CHAP. XIX. *How Arrowes broken in a wound may be drawn forth.*

BUt if it chance that the weapon is so broken in the wound, that it cannot be taken hold on by the formerly mentioned Mullets, then must you draw, or pluck it out with your Crane, or Crows bill, and other formerly described Instruments. But if the shaft be broken neer the head, so that you cannot take hold thereof with your Cranes bill, then you shall draw it forth with your Gimblet which we described before to draw forth bullets; for if such a Gimblet can be fastned in bullets, it may far better take hold of wood. But if the head be barbed, as usually the English arrowes are, then if it may be conveniently done, it will be very fitting to thrust them through the parts. For if they should be drawn out the same way they went in, there would be no small danger of breaking or tearing the Vessells and Nerves by these hooked barbes. Wherefore it is better to make a section on the other side whither the head tended, and so give it passage forth if it may be easily done; for so the wound will be the more easily clensed and consolidated. But on the contrary, if the point tend to any bone, or have many muscles or thick flesh against the head thereof, as it happens sometimes in the Thighs, Legs and Armes: then you must not thrust the head through, but rather draw it out the same way it came in, dilating the wound with fit Instruments, and by skill in Anatomie shunning the larger Nerves and Vessells. Therefore for this purpose put a hollow Dilater into the wound, and therewith take hold of both the barbs or wings of the head; and then take fast hold of the head with your Cranes-bill, and so draw them forth all three together.

A Dilater hollowed on the inside, with a Cranes-bill to take hold of the barbed head.

When to draw forth the weapon on the contrary side.

When by the same way it went

CHAP. XX. *What to be done, when an Arrow is left fastned or sticking in a bone.*

BUt if the weapon be so depact and fastned in a bone that you cannot drive it forth on the other side, neither get it forth by any other way than that it entred in by; you must first gently move it up and down, if it stick very fast in, but have a speciall care that you do not break it, & so leave some fragment thereof in the bone; then take it forth with your Crowes bill, or some other fit Instrument formerly described. Then press forth the blood, and suffer it to bleed somewhat largely, yet according to the strength of the Patient and nature of the wounded part. For thus the part shall be eased of the fulnes and ilnes of humors, and les molested with inflammation, putrefaction and other symptomes which are customarily feared. When the weapon is drawn forth, and the wound once dressed, handle it, if simple, as you do simple wounds; if compound, then according to the condition and manner of the complication of the effects; Certainly the Oil of Whelpes formerly described is very good to asswage pain. To conclude, you shall cure the rest of the Symptomes according to the method prescribed in our Treatise of wounds in generall, and to that we have formerly delivered concerning wounds made by Gunshot.

A Caution.

The benefit of bleeding in wounds.

CHAP. XXI. *Of poysoned wounds.*

IF these wounds at any time prove poysoned, they have it from their primitive cause, to wit, the empoisoned Arrowes, or Darts of their enemies. You may find it out both by the property of the pain, if that it be great and pricking, as if continually stung with Bees, for such pain usually ensues in wounds poysoned with hot poyson, as Arrowes usually are; Also you shall know it by the condition of the wounded flesh; for it will become pale and grow livid, with some signs of mortification. To conclude, there happen many and malign symptomes upon wounds which are empoysoned, being such as happen not in the common nature of usuall wounds. Therefore presently after you have plucked forth the strange bodies, encompass the wound with many and deep scarifications, apply ventoses with much flame, that so the poyson may be more powerfully drawn forth; to which purpose the sucking of the wound, performed by one whose mouth hath no soarnes therein, but is filled with oil, that so the poison which he sucks may not stick, nor adhere to the part, will much conduce. Lastly, it must be drawn forth by rubefying, vesicatory and caustick medicins, and assailed by oyntments, cataplasmes, emplaisters, and all sorts of locall medicins.

The signs of poysoned wounds.

Remedies in poysoned wounds.

The end of the Eleventh Book.

Of Contuſions and Gangrenes.

THE TWELFTH BOOK.

CHAP. I.

Gal. Lib. de artis conſtitut. Sect. 2. lib. de fracturis.

A Contuſion according to *Galen*, is a ſolution of continuity in the fleſh or bone, cauſed by the ſtroak of ſome heavy and obtuſe thing, or a fall from an high. The ſymptome of this diſeaſe is by *Hippocrates* called *Peliosis*, and *Melasma*, that is to ſay, blackneſs and blewneſs; the Latins term it *Sugillatum*. There are divers ſorts of theſe Sugillations or blackneſſes, according as the blood is poured forth into the more inward or outward part of the body. The blood is poured forth into the body, when any (for example) falls from an high, or hath any heavy weight falls upon him, as it often happens to ſuch as work in Mines, or are extreamly racked or tortured; and ſometimes by too loud and forcible exclamation. Beſides alſo by a Bullet ſhot through the body, blood is poured forth into the bellie, and ſo often evacuated by the paſſages of the Guts and bladder. The ſame may happen by the more violent and obtuſe blowes of a hard Trunchion, Club, Stone, and all things which may bruiſe and preſs the blood out of the veſſells either by extending or breaking them. For which cauſes alſo the exteriour parts are contuſed, or bruiſed ſometimes with a wound, ſometimes without, ſo that the skin being whole, and as far as one can diſcern, untoucht, the blood poures it ſelf forth into the empty ſpaces of the muſcles, and between the skin and muſcles; which affect the Ancients have tearmed *Ecchymoſis*; *Hippocrates* calls it by a peculiar name *Nauſioſis*, for that in this affect the ſwoln veins ſeem as it were to vomit, and verily do vomit or caſt forth the ſuperfluous blood which is contained in them. From theſe differences of Contuſions are drawn the indications of curing, as ſhall appear by the enſuing diſcourſe.

Cauſes of Bruiſes and Sugillations.

Sect. 2. lib. de fract.

CHAP. II. *Of the generall cure of great and enormous Contuſions.*

THe blood poured forth into the body, muſt be evacuated by viſible and not viſible evacuation. The viſible evacuation may be performed by blood-letting, Cupping-glaſſes, horns, ſcarification, horſleeches and fit purgative medicins; if ſo be the Patient have not a ſtrong and continuall feaver; The not viſible evacuation is performed by reſolving and ſudorifick potions, baths, and a ſlender diet. Concerning Blood-letting *Galens* opinion is plain, where he bids, in a fall from an high place, and generally for bruiſes upon what part ſoever they be, to open a vein, though the parties affected are not of a full conſtitution; for that unleſs you draw blood by opening a vein, there may inflammations ariſe from the concreat blood, from whence without doubt evill accidents may enſue. After you have drawn blood give him foure ounces of Oxycrate to drink; for that by the tenuity of its ſubſtance hinders the coagulation of the blood in the belly, or in ſtead thereof you may uſe this following potion. ℞ *rad. Gentianæ* ℥iij. *bulliant in Oxycrato; in colatura diſſolve rhei electi* ℥j. *fiat potio.* Theſe Medicins diſſolve, and caſt forth by ſpitting and vomit the congealed blood, if any thereof be contained in the ventricle or lungs; it will be expedient to wrap the Patient preſently in a ſheeps skin, being hot and newly taken from the ſheep, and ſprinkled over with a little myrrhe, creſſes and ſalt, and ſo to put him preſently in his bed, & then cover him ſo that he may ſweat plentifully. The next day take away the ſheeps-skin, and anoint the body with the following anodyne and reſolving ungnent. ℞ *unguent. de althæa* ℥vj. *olei Lumbric. chamæm. anethi. an.* ℥ij. *terebinth. venetæ* ℥iiij. *farinæ fænugræ. roſar. rub. pulveriſat. pul. myrtillorum, an.* ℥j. *fiat litus ut dictum eſt.* Then give this potion which is ſudorifick and diſſolves the congealed blood. ℞ *Ligni guajaci* ℥viij. *radicis enulæ camp. conſolid. majoris, ireos Florent. polypod. querni, ſeminis coriandri, aniſi, an.* ℥ß. *glycyrhiz.* ℥ij. *nepetæ, centaureæ, caryophyl. cardui ben. verbenæ, an. m. j. aquæ fontanæ lib.* xij. Let them be all beaten and infuſed for the ſpace of twelve houres, then let them boil over a gentle fire untill the one half be conſumed; let the Patient drink ſome half pinte of this drink in the morning, and then ſweat ſome hour upon it in his bed, and doe this for ſeaven or eight dayes. If any poor man light upon ſuch a miſchance, who for want of means cannot be at ſuch coſt, it will be good, having wrapped him in a ſheet, to bury him up to the chin in Dung mixed with ſome hay or ſtraw, and there to keep him, untill he have ſweat ſufficiently. I have done thus to many with very good ſucceſs. You ſhall alſo give the Patient potions made with ſyrups which have power to hinder the coagulation and putrefaction of the blood; ſuch as ſyrup of Vinegar, or Lemons, of the juice of Citrons and ſuch others to the quantitie of an ounce diſſolved in ſcabius, or *Carduus* water. You may alſo preſently after the fall give this drink, which hath power to hinder the coagulation of the blood, and ſtrengthen the bowells. ℞ *Rhei electi. in pul. redacti* ℥j. *aquæ rubiæ majoris, & plantag. in. an.* ℥j. *theriacæ* ℥ß. *ſyrupi de roſis ſiccis,* ℥ß, *fiat potus.* Let him take it in the morning for foure or five dayes. In ſtead hereof you may make a potion of one dram of *Sperma ceti* diſſolved in bugloſs or ſome other of the waters formerly mentioned, and half an ounce of ſyrup of Maiden-hair; if the diſeaſe yeeld not at all to theſe formerly preſcribed medicins, it will be good to give the Patient for nine dayes, three or foure houres before meat ſome of the following powder. ℞ *rhei torrefacti, rad. rub. majoris, centaurei, gentianæ, ariſtolo. rotundæ, an.* ℥ß. give ℥j. hereof with ſyrup of Vinegar and *Carduus* water. They ſay that the water of green Walnuts, diſtilled by an Alembick, is good to diſſolve congealed and knotted blood. Alſo you may uſe baths made of the decoction of the roots of Orris, Elecampane, Sorrell, Fennell, Marſhmallowes, Water-fern, or Oſmund

Ad ſententiam 62. ſect. 3. lib. de Articulis.

A potion to diſſolve and evacuate clotted blood.

A hot ſheeps skin.

A diſcuſſing oyntment.

A ſudorifick potion to diſſolve congealed blood.

Syrups hindering putrefaction & congealing of blood.

A drink for the ſame purpoſe.

A powder for the ſame.

The diſtilled water of green Walnuts.

Baths.

mund the waterman, the greater Comfrey, the seeds of Fænugreek, the leaves of Sage, Marjerum; the flowres of Camomile, Melilote, and the like. For a warm bath hath power to rarifie the skin, to dissolve the clotted blood, by cutting the tough and mitigating the acrid humors, by calling them forth into the surface of the body, and relaxing the passages thereof; so that the rebellious qualities being orecome, there insues an easie evacuation of the matter by vomit, or expectoration, if it flote in the stomach, or be contained in the Chest; but by stool & urin, if it lye in the lower parts; by sweats and transpiration, if it lye next under the skin. Wherefore bathes are good for those who have a *Peripneumonia* or inflammation of their Lungs, or a Pluriſie, according to the mind of *Hippocrates*, if so be that they be used, when the feaver begins to be asswaged; for so they mitigate pain, help forwards suppuration, and hasten the spitting up of the purulent matter. But we would not have the Patient enter into the bath, unless he have first used generall remedies, as blood-letting and purging; for otherwise there will be no small danger, lest the humors diffused by the heat of the bath, cause a new defluxion into the parts affected. Wherefore do not thou by any means attempt, to use this or the like remedy, having not first had the advice of a Physitian. *Lib. 3. de vict. acut. & lib. 3. de morb.*

CHAP. III. *How we must handle Contusions, when they are joyned with a wound.*

EVery great Contusion forthwith requires blood-letting, or purging, or both; and these either for evacuation, or revulsion. For thus *Hippocrates* in a contusion of the heel, gives a vomitory portion, the same day, or else the next day after the heel is broken. And then if the Contusion have a wound associating it, the defluxion must be stayed at the beginning with an ointment made of Bole Armenick, the whites of egs, and oil of roses, and myrtles, with the pouders of red roses, allome and mastich. At the second dressing apply a digestive made of the yoalk of an eg, oil of violets and turpentine. This following cataplasm shall be applyed to the near parts to help forwards suppuration. ℞. *rad. althææ, & lilii, an.* ℥ iiij. *fol. malv. violar. senecionis, an. M. ſſ. coquantur complete, & passentur per setaceum, addendo butyri recentis & olei viol. an.* ℥ iij. *farinæ volatilis quant. sufficit; fiat cataplasma ad formam pultis liquidæ.* Yet have a care in using of Cataplasms, that you do not too much exceed; for too frequent and immoderate use of them makes wounds phlegmonous, sordid and putrid. Wherefore the wound after it is come to suppuration must be cleansed, filled with flesh and cicatrized; unlesse happily the contused flesh shall be very much torn, so that the native heat forsake it, for then it must be cut away. But if there be any hope to agglutinate it, let it be sowed, and other things performed according to Art; but the stitches must not be made so close together, as when the wound is simple, and without contusion; for such wounds are easily inflamed and swell up, which would occasion either the breaking of the thred or flesh, or tearing of the skin. *Sect. lib. fract.* A suppurative Cataplasm. A caution to be observed. How contused wounds must be sowed.

CHAP. IV. *Of these Contusions which are without a wound.*

IF the skin being whole and not hurt, as far as can be discerned, the flesh which lies under it be contused, and the bloud poured forth under the skin make an *Ecchymosis*, then the Patient must be governed according to Art untill the malign symptomes which commonly happen, be no more to be feared. Wherefore in the beginning draw bloud on the opposite side, both for evacuation and revulsion. The contused part shall be scarified with equall scarifications; then shall you apply cupping-glasses or horns, both for evacuation of the bloud which causes the tumor and tension in the part; as also to ventilate and refrigerate the heat of the part, lest it turn into an Abscesse. Neither must we in the mean while omit gentle purging of the belly. The first to pick medicins ought to be astrictives, which must lye some short while upon the part, that so the Veins, and Arteries may be as it were straitned and closed up; and so the defluxion hindred; as also that the part it self may be strengthened. This may be the form of such a remedy, ℞. *Albumina ovorum nu.* iij. *olei myrtini & rosacei, an.* ℥ j. *boli armeni, & sanguin. draconis an.* ℥ ß. *nucum cupres. gallarum, pul. aluminis usti, an.* ℥ ij. *incorporentur omnia addendo aceti parum, fiat medicamentum.* Then you shall resolve it with a fomentation, cataplasm and discussing emplaisters. Phlebotomy. Scarifying Cupping-glasses. Astrictives how good in Contusions. After astrictives must follow discussives.

CHAP. V. *By what means the contused part may be freed from the fear and imminent danger of a Gangrene.*

GReat contusions are dangerous even for this cause, for that a Gangrene and mortification sometimes follows them; which *Hippocrates* teacheth to happen, when as the affected part is grown very hard and liquid. Wherefore when the part grows livid and black, and the native colour thereof, by reason of the efflux of the concreat bloud, is almost extinct; chiefly to ease the part of that burden, cupping-glasses and horns shal be applyed to the part it self being first scarified with a Lancet, or else the following Instrument termed a *Scarificator*, which hath 18. little wheels sharp and cutting like a razour, which may be straitened and slacked by the pins noted by *D.* and *P.* This instrument is to be commended for that it performs the operation quickly and gently, for it makes 18 incisions in the space that you make one with a Lancet or knife. *Sect. 2. lib. de fract.* The cause of a Gangrene. The use of a *Scarificator.*

Then shall you foment the part with strong vinegar wherein the roots of radish or of Dragons, Cuckow-pint, *Salomons* Seal, *Auripigmentum* and the like have been boiled; for such acrid things do powerfully heat, resolve and draw the concreat blood from the inner part of the body unto the skin, which by its setling in the part affected, prohibits the entrance of the vitall spirits, the preservers of its integrity; yea also extinguisheth the native heat of the same part. Now we must not use these things but with great discretion, lest so we draw not only that blood which is poured forth of the vessels, A fomentation to discusse and draw to the skin.

but

but alſo the other which is contained in the veſſels. Moreover alſo we muſt not uſe them, unleſſe when the defluxion is ſtayed. For ſmall contuſions (which *Galen* judgeth by the ſoftneſſe of the contuſed part) it will be ſufficient to apply to diſcuſſe them, Virgins wax diſſolved and mixed with Cummin ſeeds, Cloves, the root of black Briony, (which hath a wonderfull faculty to diſcuſſe all blacknesſes and ſugillations:) for the ſame purpoſe, you may alſo apply wormwood bruiſed and ſo warmed in a diſh and ſprinkled over with a little white wine. Alſo fry wormwood with oil of camomill, bran, the powder of Cloves, and Nutmegs, adding thereto a little *aqua vitæ*, then put all in a linnen cloth and apply it hot to the part. The following emplaiſter doth powerfully diſcuſſe congealed blood.

In Gal. 2. lib. de fractur.

A Scarificator.

A. Shews the cover. B. The Box, or Caſe.

A diſcuſſing plaiſter. R. *Picis nigræ* ℥ ij. *Gum. Elemi* ℥ i ß. *ſtyracis liquidæ & terebinth. com. an.* ℥ ß. *ſulphuris vivi* ℥j. *Liquefiant ſimul, fiat Emplaſtrum*; and let it be ſpred upon leather and ſo applyed.

CHAP. VI. *Of that ſtrange kind of ſymptome which happens upon contuſions of the ribs.*

Hip. ſect. 3. lib. de art. ſent. 58. & 65.

THe fleſh contuſed ſometimes by great violence becomes mucous and ſwoln, or puffed up like Veal, which the butchers blow up, the skin remaining whole. This is ſeen and happens chiefly in that fleſh which is about the ribs; for this being bruiſed either by a blow, or fall, or relyeth out thereof with a ſmall whizzing, which may be heard, and the print of your fingers wil remain as in *œdema's*. Unleſs you quickly make fit proviſion againſt this ſymptome, there is gathered in that ſpace which the fleſh departing from the bones, leaves empty, a certain purulent *ſanies*, which divers times fouls and corrupts the ribs. It will be cured, if the mucous tumor be preſently preſſed, & ſtraitly bound with ligatures, yet ſo that you hinder not the breathing, when as the affect happens upon the ribs and parts of the Cheſt. Then apply to the part a plaiſter of *Oxycroceum* or *diachylon Ireatum* with the emplaiſter *de melilot*; alſo diſcuſſing fomentations ſhall be uſed. The cauſe of ſuch a tumor is a certain mucous flegm; ſeeing that nature is ſo weak that it cannot well digeſt the nouriſhment, and aſſimilate it to the part, but leaves ſomething as it were half concocted. No otherwiſe than the conjunctive coat of the eye is ſometime ſo lifted up and ſwoln by a ſtroak, that it ſtarts as it were out of the orb of the eye, leaving ſuch filth or matter as we ſee thoſe which are blear eyed to be troubled withall; becauſe the force and naturall ſtrength of the eyes is become more weak, either by the fault of the proper diſtemperature, or the abundance of moiſture which flows thither, as it happens in thoſe tumors which are againſt nature. For flatulencies are eaſily raiſed from a wateriſh and phlegmatick humor wrought upon by weak heat, which mixed with the reſt of the humor, the tumor becomes higher.

Remedies for a mucous and flatulent rumor of the ribs.

The cauſe.

CHAP. VII. *A diſcourſe of* Mumia, *or Mummy.*

PEradventure it may ſeem ſtrange what may be the cauſe, why in this Treatiſe of curing contuſions, or bruiſes, I have made no mention of giving Mummy either in bole, or potion to ſuch as have faln from high places, or have been otherwiſe bruiſed, eſpecially ſeeing it is ſo common and uſual, yea the very firſt and laſt medicin of almoſt all our practitioners at this day in ſuch a caſe. But ſeeing I underſtood, and had learnt from learned Phyſitians, that in uſing remedies, the indication muſt alwayes be taken from that which is contrary to the diſeaſe, how could I? how can any other give Mummie in this kind of diſeaſe, ſeeing we cannot as yet know what Mummie is, or what is the nature and eſſence thereof? So that it cannot certainly be judged; whether it have a certain property contrary to the nature and effects of contuſions. This how it may have, I have thought good to relate ſomewhat at large; neither do the Phyſitians who preſcribe Mummie, nor the Authors that have written of it, nor the Apothecaries that ſell it, know any certainty thereof. For if you read the more ancient *Serapio* and *Avicen* or the modern *Matthiolus* and *Thevet*, you ſhall find quite different opinions. Ask the Merchants who bring it to us, ask the Apothecaries who buy it of them, to ſell it to us, and you ſhall hear them ſpeak diverſly hereof, that in ſuch variety of opinions, there is nothing certain and manifeſt. *Serapio* and *Avicen* have judged Mummie to be nothing elſe but *Piſſaſphalthum*; now *Piſſaſphalthum* is a certain froth or foam riſing from the Sea, or Sea waters; this ſame foam as long as it ſwims upon the water is ſoft and in ſome ſort liquid: but being driven upon the ſhore by force of tempeſt, and working of the ſea, and ſticking in the cavities of the rocks, it concreats into ſomewhat a harder ſubſtance than dryed pitch, as *Dioſcorides* ſaith. *Belonius* ſaith, that Mummie is only known to *Ægypt* and *Greece*. Others write that it is mans fleſh, taken from the carcaſes of ſuch as are dead, and covered over in the ſands in the deſerts of *Arabia*; in which Country they ſay the Sands are ſometimes carryed and raiſed up with ſuch force and violence of the winds, that they overthrow and ſuffocate ſuch paſſengers as

Mummie a frequent and uſuall medicin in contuſions.

The reaſon that the Author makes no mention thereof amongſt his medicins.

The opinion of the *Arabians* concerning it.

Lib. 4. cap. 84.

Another opinion of Mummie.

as they meet withall;the flesh of these dryed by the sand and wind they affirm to be Mummie. *Mathiolus* following the more usuall and common opinion writes, that Mummie is nothing else than a liquor flowing from the Aromatick embalments of dead bodies, which becomes dry and hard. For understanding whereof you must know from all manner of anitiquity, that the *Ægyptians* have been most studious in burying and embalming their dead;not for that end that they should become medicins for such as live,for they did not so much as respect or imagin so horrid a wickednes;but either for that they held an opinion of the generall resurrection,or that in these monuments they might have something, whereby they might keep their dead friends in perpetuall remembrance. *Thevet* not much dissenting from his own opinion,writes that the true Mummie is taken from the monuments and stony tombs of the anciently dead in *Egypt*, the chinks of which tombs were closed,and cimented with such diligence; but the incloſed bodies embalmed with pretious spices with such Art for eternity,that the linnen vestures which were wrapt about them presently after their death,may be seen whole even to this day;but the bodies themselves,are so fresh that you would judg them scarse to have been three daies buried.And yet in those Sepulchers and Vaults from whence these bodies are taken, there have been some corps of two thousands years old. The same,or their broken members are brought to *Venice* from *Syria* & *Egypt*, and thence disperst over all *Christendom*. But according to the different condition of men,the matter of their embalments were divers; for the bodies of the Nobility or Gentry are embalmed with Myrrh, Aloes,Saffron,and other precious spices,and Drugs;but the bodies of the common sort whose poverty and want of means could not undergo such cost,were embalmed with *asphaltum* or *pissasphaltum*. Another.

Now *Mathiolus* saith that all the Mummie which is brought into these parts is of this last kind & condition.For the Noblemen and chief of the province so religiously addicted to the monuments of their ancestors,would never suffer the bodies of their friends,and kindred to be transported hither for filthy gain,and such detested use,as we shall shew more at large at the end of this work. Which thing sometimes moved certain of our *French* Apothecaries, men wondrous audacious,and covetous, to steal by night the bodies of such as were hanged,and embalming them with Salt and Drugs they dryed them in an Oven,so to sel them thus adulterated in stead of true Mummie.Wherefore we are thus compelled both fooliſhly and cruelly to devoure the mangled and putrid particles of the carkasses of the baseſt people of *Egypt*, or of such as are hanged,as though there were no other way to help or recover one bruised with a fall from a high place,than to bury man by an horrid insertion in their,that is,in mans guts. Now if this Drug were any way powerfull for that they require, they might perhaps have some pretence,for this their more than barbarous inhumanity. But the case stands thus, that this wicked kind of Drug, doth nothing help the diseased,in that case, wherefore and wherein it is administred,as I have tryed an hundred times, & as *Thevet* witnesses,he tryed in himself,when as he took some thereof by the advice of a certain *Iewish* Physitian in *Egypt*, from whence it is brought;but it also infers many troubleſome symptomes,as the pain of the heart or stomach, vomiting and stink of the mouth. What our Mummie usually is. Mummie is no way good for contusions.

I perswaded by these reasons, do not only my self prescribe any hereof,to my Patients, but also in consultations, endeavour what I may, that it be not prescribed by others. It is far better according to *Galens* opinion *in Method.med.* to drink some oxycrate, which by its frigidity restrains the flowing blood,and by its tenuity of substance dissolves and discusses the congealed clots thereof.Many reasons of learned Physitians (from whom I have learned this Hiſtory of Mummie) drawn from Philosophy, whereby they make it apparent,that there can be no use of this or that Mummie in contusions, or against flowing or congealed blood, I willingly omit, for that I think it not much beneficiall to Chirurgeons to insert them here.Wherefore I judg it better to begin to treat of combustions,or burns. But hurtfull, and how? The effects of oxycrate in Contusions.

CHAP. VIII. *Of Combustions and their differences.*

ALL Combustions whether occasioned by Gunpouder, or by scalding oil,water, some metall or what things soever else,differ only in magnitude.These first cause pain in the part, and imprint in it an unnaturall heat.Which savouring of the fire, leaves that impression, which the Greeks call *Empyreuma*.There are more or lesse signs of this impression, according to the efficacy of the thing burning, the condition of the part burned, and stay upon the same.If the combustion be superficiary,the skin rises into pustules and blisters,unleſse it be speedily prevented. If it be low or deep in,it is covered with an *Eschar* or crust,the burnt flesh by the force of the fire turning into that crusty hardneſse.The burning force of the fire, upon whatsoever part it falls, leaves a hot distemper therein,condensates,contracts,and thickens the skin, whence pain proceeds; from pain there comes an attraction of humors, from the adjacent and remote parts. These humors presently turned into watery or serous moisture,whilst they seek to passe forth, and are hindred thereof by the skin condensated by the action of the fire,they lift it up higher, and raise the blisters which we see. Hence divers Indications are drawn,whence proceeds the variety of medicins for burns. For some take away the *Empyreuma*,that is,the heat of the fire,(as we term it)& asswage the pain;other hinder the rising of blisters;othersome are fit to cure the ulcer,first to procure the falling away of the *Eschar*,then to cleanse, generate flesh and cicatrize it. Remedies fit to asswage pain, and take away the fiery heat, are of two kinds;for some do it by a cooling faculty,by which they extinguish the preternaturall heat,and repress or keep back the blood and humors,which flow into the parts by reason of heat and pain. Others endued with contrary faculties,are hot and attractive; as which by relaxing the skin, and opening the pores,resolve and dissipate the serous humors,which yeeld both beginning,and matter to the pustules, and so by accident asswage the pain and heat. Refrigerating things are cold water,the water of Plantain,Night-shade,Henbane, Hemlock; the juyces of cooling hearbs, as Purslane, Lettuce, Plantain, Houseleek, Poppy,Mandrake and the like. Of these some may be compounded, as some of the forenamed The reason and symptomes of combustions. The cause of the blisters rising upon burns. Variety of medicins to take away the heat and asswage the pain.

named juices beaten with the white of an egge; Clay beaten and diſſolved in ſtrong Vinegar; roch Alome diſſolved in water, with the whites of egs beaten therein; writing ink mixed with Vinegar, and a little Camphire; *Vnguentum nutritum*, and alſo *Populeon* newly made. Theſe and the like ſhall be now and then renewed chiefly at the firſt, untill the heat and pain be gone. But theſe ſame remedies muſt be applyed warm, for if they ſhould be laid, or put to cold, they would cauſe pain, and conſequently defluxion; beſides alſo their ſtrength could not paſſe, or enter into the part, or be brought into action; but ſo applyed they aſſwage pain, hinder inflammation and the riſing of bliſters.

CHAP. IX. *Of hot and attractive medicins to be applyed to burnes.*

How fire may aſſwage the pain of burning.

AMongſt the hot and attractive things which by rarifying, drawing out, and diſſolving, aſſwage the pain and heat of combuſtions, the fire challenges the firſt place, eſpecially when the burning is but ſmall. For the very common people know and find by dayly experience, that the heat of the lightly burnt part vaniſhes away, and the pain is aſſwaged, if they hold the part which is burnt ſome prety while to the heat of a lighted candle, or burning coals; for the ſimilitude cauſeth attraction. Thus the externall fire whileſt it draws forth the fire which is internall and inuſt into the part, is a remedy againſt the diſeaſe it cauſed and bred. It is alſo an eaſily made and approved remedy, if they preſently after the burn apply to the grieved part raw Onions beaten with ſome ſalt.

Beaten Onions good for burns and how.

Now you muſt note, that this medicine takes no place, if it be once gone into an ulcer, for it would increaſe the pain and inflammation; but if it be applyed when the skin is yet whole and not excoriated, it doth no ſuch thing, but hinders the riſing of puſtles and bliſters. *Hippocrates* for this cauſe alſo uſes this kind of remedy in procuring the fall of the *Eſchar*. If any endeavour to gainſay the uſe of this remedy by that principle in Phyſick, which ſayes, that contraries are cured by contraries, and therefore affirm that Onions according to the authority of *Galen*, being hot in the fourth degree, are not good for combuſtions; let him know that Onions are indeed potentially hot, and actually moiſt, therefore they rarifie by their hot quality, and ſoften the skin by their actuall moiſture, whereby it comes to paſs that they attract, draw forth, and diſſipate the imprinted heat, and ſo hinder the breaking forth of puſtles. To conclude, the fire, as we formerly noted, is a remedy againſt the fire. But neither are diſeaſes alwayes healed by their contraries (ſaith *Galen*) but ſometimes by their like; although all healing proceed from the contrary, this word *contrary*, being more largely and ſtrictly taken, for ſo alſo a Phlegmon is often cured by reſolving medicins, which healeth it by diſſipating the matter thereof. Therefore Onions are very profitable for the burnt parts, which are not yet exulcerated or excoriated. But there are alſo many other medicins good to hinder the riſing of bliſters; ſuch as new horſe-dung fryed in oil of Wal-nuts or Roſes, and applyed to the parts. In like manner the leaves of Elder or Dane-wort boiled in oil of nuts, and beaten with a little ſalt. Alſo quenched lime powdered and mixed with *Vnguentum Roſatum*. Or elſe the leaves of Cuckow-pint and Sage beaten together with a little ſalt. Alſo Carpenters Glue diſſolved in water and anointed upon the part with a feather, is good for the ſame purpoſe. Alſo thick Verniſh which poliſhers or ſword cutlers uſe. But if the pain be more vehement, theſe medicins muſt be renewed 3 or 4 times in a day and a night, ſo to mitigate the bitternes of this pain. But if ſo be we cannot by theſe remedies hinder the riſing of bliſters, then we muſt preſently cut them as ſoon as they riſe, for that the humor contained in them, not having paſſage forth, acquires ſuch acrimony that it eats the fleſh which lyeth under it, and ſo cauſeth hollow ulcers: So by the multitude of cauſes and increaſe of matter the inflammation groweth greater, not only for nine dayes (as the common people prattle) but for far longer time; alſo ſome whiles for leſs time, if the body be neither repleat with ill humors, nor plethorick, and you have ſpeedily reſiſted the pain and heat by fit remedies. When the combuſtion ſhall be ſo great as to cauſe an *Eſchar*, the falling away muſt be procured by the uſe of emollient and humective medicins, as of greaſes, oils, butter, with a little *baſilicon*, or the following ointment. ℞ *Mucag. pſillii. & cyden. an.* ℥iiij, *gummi trag.* ℥ij. *extrahantur cum aqua parietariæ, olei liliorum* ℥iſſ. *ceræ novæ q. ſ. fiat unguentum molle.* For ulcers and excoriations you ſhall apply fit remedies, which are thoſe that are without acrimony, ſuch as *unguentum album camphoratum, deſiccativum rubrum, unguentum roſatum*, made without Venegar, or *nutritum* compoſed after this manner. ℞ *litharg yri auri* ℥iiij. *ol. roſat.* ℥iij. *ol. de papaver.* ℥iſſ. *ung. populeon* ℥iiij. *camphoræ* ℥j. *fiat unguentum in mortario plumbeo ſecundum artem.* Or oil of Egs tempered in a Leaden mortar. Alſo unquenched lime many times waſhed and mixed with *unguentum roſatum*, or freſh butter without ſalt, and ſome yolks of egs hard roaſted. Or ℞ *Butyri recent. ſine ſale, uſtulati, & colati* ℥vj. *vitell. ovor.* iiij. *ceruſ. lotæ in aqua plantag. vel roſar.* ℥ß. *tuthiæ ſimiliter lotæ,* ℥iij. *plumbi uſti, & loti,* ℥ij. *Miſceantur omnia ſimul, fiat linimentum ut decet.* Or elſe, ℞ *cort. ſambuc. viridis, & olei roſat. an. lib.* j. *bulliant ſimul lento igne, poſtea colentur, & adde olei ovorum* ℥iiij. *pul. ceruſſ. & tuthiæ præpar. an.* ℥j. *ceræ albæ quantum ſufficit, fiat unguent. molle ſecundum artem.* But the quantity of drying medicins may alwayes be encreaſed or diminiſhed according as the condition of the ulcer ſhall ſeem to require. The following remedies, are fit to aſſwage pain, as the mucilages of Line ſeeds, of the ſeeds of *Pſillium*, or Flea-wort, and quinces extracted in roſewater, or fair water, with the addition of a little camphire; and leſt that it dry too ſpeedily, adde thereto ſome oil of Roſes. Alſo five or ſix yolks of egs mixed with the mucilages of Line ſeed, the ſeed of *Pſillium*, and quinces often renewed, are very powerfull to aſſwage pain. The women which attend upon the people in the Hoſpitall in *Paris*, do happily uſe this medicin againſt burns. ℞ *Lard. conſciſi libram unam*; let it be diſſolved in Roſewater, then ſtrained through a linnen cloath, then waſh it foure times with the water of hen-bane or ſome other of that kind, then let it be incorporated with eight yolks of new laid egs, and ſo make an ointment. If the ſmart be great, as uſually it is in theſe kinds of wounds, the ulcer or ſores ſhall be covered over with a piece of Tiffany, leſt you hurt them, by wiping them with ſumewhat a courſe cloth, and ſo alſo the matter may eaſily come forth,

Lib. 5. ſimpl.

How often in a day theſe muſt be dreſſed.

Medicins for an *Eſchar*.

A deſcription of *Nutritum*.

A remedy for burns commonly uſed in the Hoſpitall of *Paris*.

and

and the medicins easily enter in. Also you must have a care when the eyelids, lips, sides of the fingers, neck, the armpits, hams, and bending of the elbow are burnt, that you suffer not the parts to touch one the other, without the interposition of some thing; otherwise in continuance of time they would grow and stick together. Therefore you shall provide for this, by fit placing the parts, and putting soft linnen rags between them. But you must note, that deep combustions, and such as cause a thicker *Eschar*, are less painfull, than such as are but only superficiary. The truth hereof you may perceive by the example of such as have their limbs cut off, and seared or cauterised with an hot Iron; for presently after the cauterising is performed they feel little pain. For this great combustion takes away the sense, the vehemency of the sensory or thing affecting the sense, depriving the sensitive parts of their sense; As we have formerly noted when we treated of wounds and pains of the Nerves. The falling away of such *Eschars* shall be procured by somewhat a deep scarification which may pierce even to the quick, that so the humors which lye under it may enjoy freer perspiration, and emollient medicins may the freelier enter in, so to soak, moisten and soften the *Eschar* that it may at length fall away. The rest of the cure shall be performed by detergent and sarcotick medicins, adding to the former ointments metalline powders, when the present necessity shall seem so to require. But we cannot justly say in what proportion and quantity each of these may be mixed, by reason of that variety which is in the temper and consistence of bodies, and the stubborness and gentleness of diseases. After a burn the scar which remaineth is commonly rough, unequall, and ill favoured: therefore we will tell you in our treatise of the plague how it must be smoothed, and made even.

Why deep combustions are less painfull then superficiary.

I must not here omit to tell you, that Gunpowder set on fire doth often so penetrate into the flesh, not ulcerating nor taking off the skin, and so insinuate and throughly fasten it selfe into the flesh by its tenuity, that it cannot be taken or drawn out thence by any remedies, no not by *Phænigmes* nor vesicatories, nor scarification, nor ventoses, nor horns, so that the prints thereof alwayes remain, no otherwise than the marks which the Barbarians burn in their slaves, which cannot afterwards be taken away or destroyed by any Art.

Marks or spots made in the face by corns of Gunpowder cannot be taken away.

CHAP. X. *Of a Gangrene and Mortification.*

CErtainly the malign symptomes which happen upon wounds, and the solutions of Continuity are many, caused either by the ignorance or negligence of the Chirurgeon; or by the Patient, or such as are about him, or by the malignity and violence of the disease: but there can happen no greater then a Gangrene, as that which may cause the mortification and death of the part, and oft times of the whole body; wherefore I have thought good in this place to treat of a Gangrene, first giving you the definition, then shewing you the causes, signs, prognosticks, and lastly the manner of cure. Now a Gangrene is a certain disposition, and way to the mortification of the part, which it seiseth upon, dying by little and little. For when there is a perfect mortification, it is called by the Greeks *Sphacelos*, by the Latines *Syderatio*, our countrymen terme it the fire of Saint *Anthony* or Saint *Marcellus*.

Gal. 2. ad Glauconem.

CHAP. XI. *Of the generall and particular causes of a Gangrene.*

THe most generall cause of a Gangrene is, when by the dissolution of the harmony and joint temper of the foure first qualities, the part is made unapt to receive the faculties, the Naturall, Vitall, and Animall spirits, by which it is nourished, lives, feels, and moves. For a part deprived by any chance of these as of the light, languishes and presently dyes. Now the particular causes are many: and these either primitive, or antecedent. The primitive or externall are combustions caused by things either actually or potentially burning; actually, as by fire, scalding oil or water, gunpowder fired and the like. But potentially by acrid medicins; as Sublimate, vitrioll, potentiall cauteries and other things of the same nature: for all these cause a great inflammation in the part. But the ambient air may cause great refrigerations, and also a Gangrene, which caused *Hippocrates lib. de Acr.* to call great refrigerarions of the brain *Sphacelisme*. Therefore the unadvised and unfit application of cold and narcotick things, a fracture, luxation and great contusion, too strait bandages, the biting of beasts, especially of such as are venemous, a puncture of the Nerves and Tendons, the wounds of the nervous parts and joints, especially in bodies which are plethorick and repleat with ill humors, great wounds whereby the vessels which carry life are much cut, whence an *aneurisma*, and lastly many other causes, which perturb that harmony of the foure prime qualities which we formerly mentioned, and so infer a Gangrene.

The generall cause of a Gangrene.

The particular causes.

Cold causeth a Gangrene.

CHAP. XII. *Of the Antecedent causes of a Gangrene.*

NOw the antecedent or internall and corporeall causes of a Gangrene, are plentifull and abundant defluxions of humors, hot or cold, falling into any part. For seeing the faculty of the part is unapt and unable to sustain and govern such plenty of humors, it comes to passe that the native heat of the part is suffocated and extinct for want of transpiration. For the Arteries are hereby so shut or pent up in a strait, that they cannot perform their motions of contraction and dilatation, by which their native heat is preserved and tempered. But then the Gangrene is chiefly uncureable when the influx of humors first takes hold of the bones, and inflammation hath its beginning from them. For in the opinion of *Galen*, all these kind of affects which may befall the flesh, are also incident to the bones. Neither only a Phlegmon or inflammation, but also a rottennesse and corruption

How defluxions cause a Gangrene.

An uncureable Gangrene.

Lib. de humor. præter natur.

ruption doth oft-times firſt invade and begin at the bones; for thus you may ſee many who are troubled with the Leproſie and French diſeaſe, to have their skin and fleſh whole and fair to look on, whoſe bones notwithſtanding are corrupt and rotten, and oft-times are much decayed in their proper ſubſtance. This miſchief is cauſed by a venemous matter, whoſe occult qualitie we can ſcarſe expreſſe by any other name than poyſon inwardly generated. Oft-times alſo there is a certain acrid and ſtinking filth generated in fleſh with a malign and old ulcer, with which if the bones chance to be moiſtened they become foul and at length mortified: of which this ſaying of *Hippocrates* is extant, Ulcers of a years continuance or longer, muſt neceſſarily foul the bone, and make the ſcars hollow. Whither alſo belongs this ſaying of the ſame party; An *Eriſipelas* is ill in the laying bare of a bone. But this flowing venenate and gangrenous matter is ſomewhiles hot, as in peſtilent Carbuncles, which in the ſpace of four and twenty hours by cauſing an *eſchar*, bring the part to mortification: otherwhiles cold, as we ſee it divers times happens in parts which are poſſeſt with a Gangrene, no pain, tumor, blackneſs, nor any other precedent ſign of a Gangrene going before. For *Iohn de Vigo* ſaith, that happened to a certain gentlewoman of *Genoa* under his cure.

Aph. 5. 8 ſect. 6.

A Gangrene by efflux of a cold matter.

A notable Hiſtory.

I remember the ſame happened to a certain man in *Paris*, who ſupping merrily and without any ſenſe of pain, went to bed, and ſuddainly in the night time a Gangrene ſeiſed on both his legs, cauſed a mortification without tumor, without inflammation; only his legs were in ſome places ſpred over with livid, black and green ſpots, the reſt of the ſubſtance retaining his native colour: yet the ſenſe of theſe parts was quite dead, they felt cold to the touch; and if you thruſt your lancet into the skin no blood came forth. A Counceil of Phyſitians being called, they thought good to cut the skin, and fleſh lying under it, with many deep ſcarifications; which when I had done, there came forth a little black, thick and as it were congealed blood; wherefore this remedy, as alſo divers other, proved to no purpoſe, for in concluſion a blackiſh colour comming into his face, and the reſt of his body, he dyed frantick. I leave it to the Readers judgement, whether ſo ſpeedy, and ſuddainly cruell a miſchief could proceed from any other than a venenate matter; yet the hurt of this venenate matter is not peculiar, or by its ſelf. For oft-times the force of cold, whether of the encompaſſing air, or the too immoderate uſe of Narcotick medicins, is ſo great, that in a few hours it takes away life from ſome of the members, and divers times from the whole body, as we may learn by their example, who travell in great ſnowes, and over mountains congealed, and horrd with froſt and ice. Hence alſo is the extinction of the native heat and the ſpirits reſiding in the part, and the ſhutting forth of that which is ſent by nature to aid or defend it. For when as the part is bound with rigid cold, and as it were frozen, they cannot get nor enter therein. Neither if they ſhould enter into the part, can they ſtay long there, becauſe they can there finde no fit habitation, the whole frame and government of nature being ſpoiled, and the harmony of the four prime qualities deſtroyed, by the offenſive dominion of pred ominant cold their enemy, whereby it cometh to paſſe that flying back from whence they firſt came; they leave the part deſtitute and deprived of the benefit of nouriſhment, life, ſenſe and motion.

Simple cold may cauſe a Gangrene.

A Hiſtory.

A certain Briton an Hoſtler in *Paris*, having drunk ſoundly after ſupper, caſt himſelf upon a bed; the cold air coming in at a window left open, ſo took hold upon one of his legs, that when he waked forth of his ſleep, he could neither ſtand nor goe. Wherefore thinking only that his leg was numb, they made him ſtand to the fire; but putting it very nigh, he burnt the ſole of his foot without any ſenſe of pain, ſome fingers thickneſs, for a mortification had already poſſeſſed more than halfe his leg. Wherefore after he was carryed to the Hoſpitall, the Chirurgeon who belonged thereto, endeavoured by cutting away of the mortified leg to deliver the reſt of the body from imminent death; but it proved in vain; for the mortification taking hold upon the upper parts, he dyed within three dayes, with troubleſome belching and hicketting, raving, cold ſweat, and often ſwounding. Verily all that ſame winter, the cold was ſo vehement that many in the Hoſpitall of *Paris* loſt the wings or ſides of their noſtrills, ſeiſed upon by a mortification without any putrefaction. But you muſt note, that the Gangrene which is cauſed by cold, doth firſt and principally ſeiſe upon the parts moſt diſtant from the heart, the fountain of heat, to wit, the feet and legs; as alſo ſuch as are cold by nature, as griſtly parts, ſuch as the noſe and eares.

What parts are uſually taken by a Gangrene occaſioned by cold.

CHAP. XIII. *Of the ſigns of a Gangrene.*

Sect. 4. lib. de fract.

THe ſigns of a Gangrene which inflammation or a phlegmon hath cauſed, are pain and pulſation without manifeſt cauſe, the ſudden changing of the fiery and red colour into a livid or black, as *Hippocrates* ſhewes where he ſpeaks of the Gangrene of a broken heel. I would have you here to underſtand the pulſifick pain not only to be that which is cauſed by the quicker motion of the Arteries, but that heavy and pricking which the contention of the naturall heat doth produce by raiſing a thick cloud of vapours from theſe humors which the Gangrene ſets upon. The ſigns of a Gangrene cauſed by cold, are, if ſuddainly a ſharp pricking and burning pain aſſaileth the part; for *penetrabile frigus adurit*, (*i*) piercing cold doth burn: if a ſhining redneſs as if you had handled ſnow, preſently turn into a livid colour; if in ſtead of the accidentall heat which was in the part, preſently cold and numbneſs ſhall poſſeſſe it, as if it were ſhook with a quartain feaver. Such cold if it ſhall proceed ſo far as to extinguiſh the native heat, bringeth a mortification upon the Gangrene; alſo oft-times convulſions & violent ſhaking of the whole body, wondrous troubleſome to the braln & the fountains of life. But you ſhall know Gangrenes cauſed by too ſtrait bandages, by fracture, luxation, and contuſion, by the hardneſs which the attraction and flowing down of the humors hath cauſed, little pimples or bliſters ſpreading or riſing upon the skin by reaſon of the great heat, as in a combuſtion; by the weight of the part occaſioned through the defect of the ſpirits not now ſuſtaining the bur-

VVhat a pulſifick pain is.

Signs of a Gangrene proceeding of cold.

Signs of Gangrenes proceeding from ſtrait bandages, or ligatures, &c.

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den of the member, and lastly from this, the pressing of your finger upon the part, it will leave the print thereof as in an *œdema*; and also rom this, that the skin cometh from the flesh without any manifest cause.

Now you shall know Gangrenes arising from a bite, puncture, *aneurisma*, or wound in plethorick and ill bodies, and in a part indued with most exquisite sense, almost by the same signs as that which was caused by inflammation. For by these and the like causes, there is a far greater defluxion and attraction of the humors than is fit, when the perspiration being intercepted and the passages stopt, the native heat is oppressed and suffocated. But this I would admonish the young Chirurgeon, that when by the fore-mentioned signs he shall find the Gangrene present, that he do not defer the amputation for that he finds some sense, or small motion yet residing in the part. For oft-times the affected parts are in this case moved not by the motion of the whole muscle, but only by means, that the head of the muscle is not yet taken with the Gangrene: with moving it self by its one strength, also moves its proper an continued tendon and tail though dead already; wherefore it is ill to make any delay in such causes. d

Signs of a Gangrene occasioned by a bite, puncture, &c.

CHAP. XIIII. *Of the Prognosticks in Gangrenes.*

HAving given you the signs and causes to know a Gangrene; it is fit we we also give you the prognostick. The sierceneſſe and malignity thereof is so great, that unleſſe it be most speedily withstood the part it self will dye, and also take hold of the neighbouring parts by the contagion of its mortification: which hath been the cause that a Gangrene by many hath been termed an *Esthiomenos*. For such corruption creeps out like poyson, and like fire eats, gnaws, and destroyes all the neighbouring parts, untill it hath spread over the whole body. For as *Hippocrates* writes, *Lib. de vulner. capitis*; *Mortui & viventis nulla est proportio*, (*i*) there is no proportion between the dead and living. Wherefore it is fit presently to separate the dead from the living; for unleſſe that be done, the living wil dye, by the contagion of the dead. In such as are at the point of death a cold sweat flows over all their bodies: they are troubled with ravings, and watchings,, belchings and hicketing molest them; and often swoundings invade them, by reason of the vapours abundantly and continually raised from the corruption of the humors and flesh, and so carried to the bowells and principall parts, by the Veins, Nerves, and Arteries. Wherefore when you have foretold these things to the friends of the Patient, then make haſt to fall to your work.

Why a Gangrene is called *Esthiomenos*.

The quick impatient of the dead.

CHAP. XV. *Of the generall cure of a Gangrene.*

THe Indications of curing Gangrenes are to be drawn from their differences, for the cure must be diversly instituted according to the essence and magnitude. For some Gangrenes possesse the whole member; others only some portion thereof; some are deep; othersome superficiall only. Also you must have regard to the temper of the body. For soft and delicate bodies, as of children, women, Eunuches, and idle persons, require much milder medicins, than those who by nature and custome, or vocation of life, are more strong and hardy, such as husbandmen, labourers, mariners, huntsmen, porters, and men of the like nature who live sparingly and hardly. Neither must you have respect to the body in generall, but also to the parts affected; for the fleshy and musculous parts, are different from the solid, as the nerves and joints, or more solid, as the *Vertebræ*. Now the hot and moist parts, as the privities, mouth, womb, and fundament, are easilyer and sooner taken hold of by putrefaction, wherefore we must use more speedy means to help them. Wherefore if the Gangrene be chiefly occasioned from an internall cause, he must have a dyet prescribed for the decent and fitting use of the six things not naturall. If the body be plethorick, or full of ill humors; you must purge, or let blood by the advice of a Physitian. Against the ascending up of vapours to the noble parts, the heart must chiefly be strengthened with Treacle dissolved in Sorrell, or *Carduus* water; with a bole of Mithridate, the conserves of Roses and Bugloſſe; and with Opiates made for the present purpose according to Art; this following Apozeme shall be outwardly applyed to the region of the heart. R. *aquæ rosar. & nenuphar. an.* ℥ iiij. *aceti scillitici* ℥ j. *coralforum, santalorum alborum & rubrorum, rosar. rub. in pulver. redactarum, & spodii, an.* ʒ j. *mithrid. & theriacæ, an.* ʒ ij ʃ. *trochiscorum de Caphura* ʒ ij. *flor. cardial. in pollin. redactarum, p. ij. croci* ʒ j. *ex omnibus in pollinem redactis, fiat epithema*. Which may be applyed upon the region of the heart with a scarlet cloth or spunge. These are usually such as happen in the cure of every Gangrene.

Various Indications of curing a Gangrene.

What parts soonest taken hold by a Gangrene

A cordiall Epithema.

CHAP. XVI. *Of the particular cure of a Gangrene.*

THe cure of a Gangrene, caused by the too plentifull and violent defluxion of humors suffocating the native heat, by reason of great Phlegmons, is performed by evacuating and drying up the humors, which putrefie by delay and collection in the part. For this purpose scarifications and incisions, great, indifferent, small, deep and superficiary according to the condition of the Gangrene, are much commended; that so the burdened part may injoy the benefit of perspiration; and the contained humors, of diffiation, or evacuation of their sooty excrements. Let incisions be made when the affect is great, deep in, and neer to mortification. But scarifications may be used when the part first begins to putrefie, for the greatneſſe of the remedy must answer in proportion to that of the disease. Wherefore if it penetrate to the bones, it will be fit, to cut the skin and flesh with many and deep incisions, with an incision knife made for that purpose; yet take heed of cutting the larger nerves and vessels, unleſſe they be wholly putrefied, for if they be not yet putrefied, you shall make your incisions in the spaces between them; if the Gangrene be leſſe, we must rest

The cure of a Gangrene made by inflammation.

satisfied with only scarifying it. When the scarifications and incisions are made, we must suffer much blood to flow forth, that so the conjunct matter may be evacuated. Then must we apply and put upon it such medicins as may by heating, drying, resolving, clensing and opening, amend and correct the putrefaction, and by piercing to the bottom may have power to overcome the virulencie already impact in the part. For this purpose Lotions made of the lye of the Ashes of fig-tree or Oak wherein Lupins have been throughly boyled are good. Or you may with lesse trouble make a medicin with salt water, wherein you may dissolve Aloes and *Ægyptiacum*, adding in the conclusion a little *Aqua vitæ*; for *aqua vitæ* and calcined vitrioll are singular medicins for a Gangrene. Or ℞. *acet. opimi* ℔j. *mel. ros.* ℥iiij. *syrup. acetosi* ℥iij. *salis com.* ℥v. *bulliant simul, adde aquæ vitæ*, ℔.ſ. Let the part be frequently washed with this medicin, for it hath much force to represse Gangrenes. After your Lotion, lay *Ægyptiacum* for a Liniment, and put it into the incisions; for there is no medicin, more powerfull against putrefaction, for by causing an *Eschar*, it separates the putrid flesh from the sound. But we must not in this kind of affect expect that the putrid flesh may of it self fall from the sound; but rather cut off with your incision knife or fissers, whatsoever thereof you can, and then put to it *Ægyptiacum* as oft as need shall require. The knowledg hereof may be acquired from the colour, smell, and sensibleness of the flesh it self. The description of the *Ægyptiacum*, whose wondrous effects I have often tryed in these causes, is this. ℞ *floris æris, aluminis roch. mellis com. an.* ℥iij. *aceti acerrimi* ℥v. *salis com.* ℥j. *vitrioli rom.* ℥ ß. *sublimati pul.* ℥ij. *bulliant omnia simul ad ignem, fiat unguent.* If the force of the putrefaction in the part be not so great, a weaker *Ægyptiacum* may serve. When you have put in the *Ægyptiacum*, then presently lay the following Cataplasm thereupon. For it hinders putrefaction, resolves, clenses and dryes up the virulent *sanies*, and by the dry subtlety of the parts penetrates into the member, strengthens it, and asswages the pain. ℞. *farin. fabar. horder. erobi, lent. lupin. an.* ℔.ſ. *sal. com. mellis rosat. an.* ℥iiij. *succi absinth. marrub. an.* ℥iiß. *aloes, masticbes, myrrhæ, & aquæ vit. an.* ℥ij. *oxymelitis simpl. quantum sufficit; fiat Cataplasma molle secundum artem*; Somewhat higher than the part affected, apply this following astringent, or defensitive, to hinder the flowing down of the humors into the part, and the rising up of the vapours from the putrid part into the whole body. ℞ *olei rosati, & myrtill. an.* ℥iiij. *succi plantag. solani, sempervivi, an.* ℥ij. *albumin ovorum* 5. *boli armeni, terræ sigillatæ subtiliter pulverisatorum, an.* ℥j. *oxycrati quantum sufficit, misce ad usum dictum.* But these medicins must be often renewed. If the grief be so stubborn, that it will not yeeld to the described remedies, we must come to stronger, to wit, Cauteries, after whose application, *Galen* bids to put upon it the juice of a Leek with salt beaten and dissolved therewith, for that this medicin hath a piercing and drying faculty, and consequently to hinder putrefaction. But if you prevail nothing with Cauteries, then must you come to the last remedy and refuge, that is, the amputation of the part; For according to *Hippocrates*, to extream diseases exquisitely extream remedies are best to be applyed. Yet first be certain of the mortification of the part; for it is no little or small matter to cut off a member without a cause.

The description of an Ægyptiacum.

Astringents that may be used in cure of a Gangrene.

Gal. 2. ad Glauconem.

Aphor. 6. sect. 11.

Therefore I have thought it fit to set down the signs, whereby you make know a perfect and absolute mortification.

CHAP. XVII. *The signs of a perfect* Necrosis *or Mortification.*

YOu shall certainly know that a Gangrene is turned into a Sphacell, or mortification and that the part is wholly and throughly dead, if it look of a black colour, and be colder than stone to your touch, the cause of which coldness is not occasioned by the frigidity of the air; if there be a great softness of the part, so that if you presse it with your finger it rises not again, but retains the print of the Impression. If the skin come from the flesh lying under it; if so great and strong a smell exhale (especially in an ulcerated Sphacell) that the standers by cannot indure or suffer it; if a sanious moisture, viscid, green or blackish flow from thence; if it be quite destitute of sense and motion, whether it be pulled, beaten, crushed, pricked, burnt, or cut off. Here I must admonish the young Chirurgeon, that he be not deceived concerning the losse or privation of the sense of the part. For I know very many deceived as thus; the Patients pricked on that part would say they felt much pain there. But that feeling is oft deceitfull, as that which proceeds rather from the strong apprehension of great pain which formerly raigned in the part, than from any faculty of feeling as yet remaining. A most clear and manifest argument of this false and deceitfull sense appears after the amputation of the member; for a long while after they will complain of the part which is cut away.

A note concerning the unsensiblenesse of the part.

Verily it is a thing wondrous strange and prodigious, and which will scarse be credited, unlesse by such as have seen with their eyes, and heard with their ears the Patients who have many months after the cutting away of the Leg, grievously complained that they yet felt exceeding great pain of that leg so cut off. Wherefore have a speciall care lest this hinder your intended amputation; a thing pitifull, yet absolutely necessary for to preserve the life of the Patient and all the rest of his body, by cutting away of that member which hath all the signs of a Sphacell and perfect mortification; for otherwise the neglected fire will in a moment spread over all the body, and take away all hope of remedy; for thus *Hippocrates* wisheth: That Sections, Ustions, and Terebrations must be performed as soon as need requires.

A wondrous symptome.

Sect. 7. Lib. 6. Epidem.

CHAP. XVIII. *Where Amputation must be made.*

IT is not sufficient to know that Amputation is necessary, but also you must learn in what place of the dead part, it must be done, and herein the wisdom and judgment of the Chirurgeon is most apparent. Art bids to take hold of the quick, and to cut off the member in the sound flesh; but the same art wisheth us, to preserve whole that which is sound, as much as in us lies. I will shew thee by a familiar example how thou maist carry thy self in these difficulties. Let

The controversy decided.

us

us suppose, that the foot is mortified even to the ancle; here you must attentively mark in what place you must cut it off. For unless you take hold of the quick flesh in the amputation, or if you leave any putrefaction, you profit nothing by amputation, for it will creep and spread over the rest of the body. It befits Physick ordained for the preservation of mankind, to defend from the iron or instrument & al manner of injury, that which injoyes life and health. Wherefore you shall cut off as little of that which is found as you possibly can; yet so that you rather cut away that which is quick, than leave behind any thing that is perished, according to the advice of *Celsus*. Yet oft-times the commodity of the action of the rest of the part, and as it were a certain ornament thereof, changes this counsell. For if you take these two things into your consideration they will induce you in this propounded case and example, to cut off the Leg some five fingers breadth under the knee. For so the Patient may more fitly use the rest of his Leg and with lesse trouble, that is, he may the better go on a wooden Leg; for otherwise, if according to the common rules of Art, you cut it off close to that which is perished, the Patient will be forced with trouble to use three Legs in stead of two. *Lib. 7. cap. 33.*

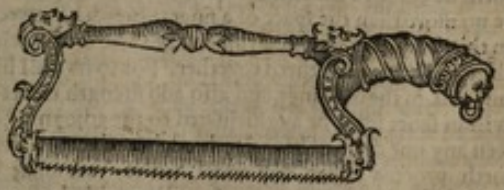
For I so knew Captain *Francis Clerk*, when as his foot was stricken off with an iron bullet shot forth of a man of war, and afterwards recovered and healed up, he was much troubled and wearied with the heavy and unprofitable burden of the rest of his Leg, wherefore though whole and sound he caused the rest thereof to be cut off, some five fingers breadth below his knee; and verily he useth it with much more ease and facility than before in performance of any motion. We must do otherwise if any such thing happen in the Arm; that is, you must cut off as little of the sound part as you can. For the action of the Legs much differ from these of the Arms, and chiefly in this that the body rests not, neither is carried upon the Arms, as it is upon the feet and Legs. An observable History.

CHAP. XIX. *How the section or amputation must be performed.*

THe first care must be of the Patients strength, wherefore let him be nourished with meats of good nutriment, easie digestion, and such as generate many spirits; as with the yolks of Egs, and bread tosted and dipped in Sack or Muskadine. Then let him be placed, as is fit, and drawing the muscles upwards towards the sound parts, let them be tyed with a strait ligature a little above that place of the member which is to be cut off, with a strong and broad fillet like that which women usually bind up their hair withall. This ligature hath a threefold use; the first is, that it hold the muscles drawn up together with the skin, so that retiring back presently after the performance of the work, they may cover the ends of the cut bones, and serve them in stead of boulsters or pillows when they are healed up, & so suffer with lesse pain the compression in sustaining the rest of the body; besides also by this means the wounds are the sooner healed and cicatrized; for by how much more flesh or skin is left upon the ends of the bones, by so much they are the sooner healed and cicatrized. The second is, for that it prohibits the flux of bloud by pressing and shutting up the veins and arteries. The third is, for that it dulls the sense of the part by stupefying it, the animall spirits by the strait compressing being hindred from passing in by the Nerves. Wherefore when you have made your ligature, cut the flesh even to the bone with a sharpe and well cutting incision knife, or with a crooked knife, such as is here expressed. The Ligature of the part.

A crooked knife fit for dismembring; or a dismembring knife.

The Figure of such a Saw.

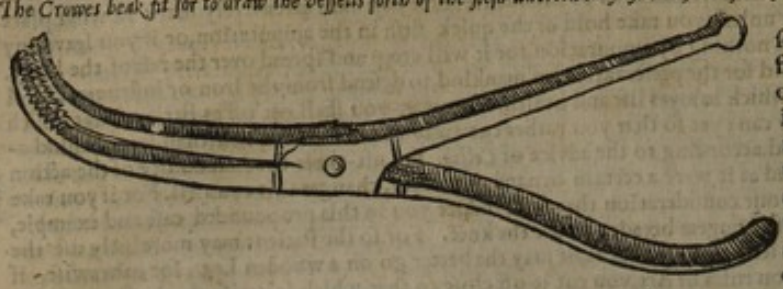


Now you must note, that there usually lies between the bones, a portion of certain muscles which you cannot easily cut with a large incision or dismembring knife; wherefore you must carefully divide it and separate it wholly from the bone, with an instrument made neatly like a crooked incision knife. I thought good to advertise thee hereof; for if thou shouldest leave any thing besides the bone to be divided by the Saw, you would put the Patient to excessive pain in the performance thereof; for oft things, as flesh, tendons and membranes, cannot be easily cut with a Saw. Therefore when you shall come to the bared bone, all the other parts being wholly cut asunder and divided, you shall nimbly divide it with a little Saw about some foot and three inches long, and that as near to the sound flesh as you can. And then you must smooth the front of the bone which the Saw hath made rough. A caution to be observed.

CHAP. XX. *How to stanch the bleeding when the member is taken off.*

WHen you have cut off and taken away the member, let it bleed a little according to the strength of the Patient, that so the rest of the part may afterwards be lesse obnoxious to inflammation and other symptomes; Then let the veins and arteries be bound up as speedily and straitly as you can; that so the course of the flowing blood may be stopped and wholly stayed. Which may be done by taking hold of the vessels with your Crows beak, whereof the figure follows.

The Crowes beak fit for to draw the vessells forth of the flesh wherein they lye hid, that so they may be tyed or bound fast.



How to draw forth the vessells and bind them.

The ends of the vessells lying hid in the flesh, must be taken hold of and drawn with this instrument forth of the muscles whereinto they presently after the amputation withdrew themselves, as all parts are still used to withdraw themselves towards their originalls. In performance of this work, you need take no great care, if you together with the vessells comprehend some portion of the neighbouring parts, as of the flesh, for hereof will ensue no harme; but the vessells will so be consolidated with the more ease, than if they being bloodlesse parts should grow together by themselves. To conclude, when you have so drawn them forth, bind them with a strong double thred.

CHAP. XXI. *How after the blood is stanched, you must dresse the wounded member.*

How the lips of the dismembred part are to be joined together.

WHen you have tyed the Vessells, loose your Ligature which you made above the place of amputation; then draw together the lips of the wound with four stitches made acrosse, having taken good hold of the flesh; for thus you shall draw over the bones that part of the skin and cut muscles drawn upwards before the amputation, and cover them as close as you can, that so the air may the lesse come at them, and that so the wound may be the more speedily agglutinated. But when we say, draw together the lips of the wound with four stitches, you must not so understand it, as that you must endeavour, to draw them so close as to touch each other, for that is impossible; for the stitches would sooner break out, and so the part would lye bare. Wherefore it will be sufficient to draw them indifferent close together, that so you may suffer the skin and flesh thereunder to enjoy its former liberty which it possest before the drawing up, and so in fine by natures assistance, the wound may be the more easily agglutinated.

CHAP. XXII. *How you must stop the bleeding, if any of the bound up vessells chance to get loose.*

THe business hitherto being performed as we said, if peradventure it happen that any bandage of any of the vessels be unloosed, then must you again bind the member with that kind of Ligature which you did before the amputation thereof. Or else, which is better, more easie and lesse painfull, let your servant take hold of the member with both his hands, pressing his fingers strait, stop the passage of the loosed vessell, for so he may stanch the bleeding. Then let the work-master take a needle some four fingers long, square, and having sharp edges, drawing after it a three or four doubled strong thred. With this let him bind the vessell after the following manner. Let him thrust his needle on the outside into the flesh, some half fingers breadth from the loosed vessell untill he come to the end thereof, then let him put it about it, and bring it back again, but so that there be no more than the space of a fingers breadth between the going in, and coming forth of the needle. In this space let him put a linnen rag three or four times doubled, and thereupon bind somewhat strait the two ends of the thred together. For so he shall hinder the knot from hurting the flesh which lies under it in the bindings, and also add strength thereto. For so the bound up orifice of the vessell will in short space be agglutinated to the adjoyning flesh, and that so firmly, that there hath never been seen any one drop of blood to have flowed from a vessell so bound up. But if the blood which flows forth proceed from any small vessell, you must not use this suture and ligature, nor make any such great matter thereof; for it will quickly be stanched by the only application of Astringents presently to be mentioned.

The Hæmorrhagie of small vessels is not to be regarded.

CHAP. XXIII. *How to perform the residue of the cure of the amputated member.*

An emplastick medicine.

NOw must we shew what medicins are fitting to be applyed after the amputation of a member; which are Emplasticks, as these which exceedingly conduce to green wounds. As ℞ *boli arm.* ℥iiij. *farin. vol.* ℥iij. *picis, resinæ, an.* ℥ij. *pulverisentur omnia subtiliss. & simul mixtis fiat pulvis*; herewith let the wound be strewed, and lay thereupon dry Lint; but let the following repercussive or defensitive be applyed to the member. ℞ *Album ovorum* vj. *boli arm. sang. drac. gypsi, terræ sigill. aloes, mastiches, gallar. combust. an.* ℥ij. *in pollinem redigantur omnia, & bene agitentur, addendo olei rosarum & myrtil. an.* ℥j. *fiat defensitivum ad formam mellis.* This ointment must be applyed upon stoops dipped in Oxycrate, and that so that it may not only cover the cut member; but also be spread further and cover the neighbouring parts; as when the Leg is cut off, it must be laid upon the joint, and spread higher than the knee, some four fingers upon the thigh; for it hath not only a repercussive faculty, but it also strengthens the part, hinders defluxion by tempering the blood, asswaging pain, and hindring inflammation. It will also be good to moisten your double cloths and bandages in Oxycrate; then must you place the member in an indifferent posture upon a pillow stuffed with oaten huskes or chaffe, Stags hair, or wheat bran. It must not be stirred after the first dressing (unless great necessity urge) for four dayes in winter, but somewhat

A repercussive.

How to place the member & how often to dress it.

somewhat sooner in summer. For the ligatures wherewith the vessells are bound, they must not be loosed, or otherwise taken away, before the mouthes of the vessells are covered with their glue or flesh, lest by too much hast you cause a new flux of blood. This agglutination will be performed by applying refrigerating, astringent, and emplastick medicins, such as this following powder. R. *boli arm. farin. hord. picis. ref. gypsi, an.* ℥iiij. *Aloes, nucum cup. cort. granat. an.* ℥j. *incorporentur omnia simul, fiat pulvis subtilis:* herewith let the whole ulcer be strewed over for three or four dayes space; which being ended, let only the seats of the vessells be powdred therewith, and that for eight or ten dayes, so that we need no further doubt of the agglutination of the vessells. In the mean space let the digestive be applyed to the rest of the Ulcer untill it be come to suppuration; for then you shall give over your digestive, and betake you to detersive and mundificative medicins: As R. *terebinth. ven. lotæ in aqua vitæ* ℥rj. *mellis ros. colati* ℥iiij. *succi plantag. Apii, centaur. minoris, an.* ℥ij. *bulliant omnia simul usque ad consumptionem succorum, auferantur ab igne, addendo farinæ fab. & hord. an.* ℥j, *theriac. Gal.* ℥ß. *aloes, myrrhæ, aristoloch. an.* ℥ilj. *croci* ℈j. *fiat mundificativum.* But seeing the case stands so that the Patients imagin they have their members yet entire, and yet do complain thereof (which I imagin to come to pass, for that the cut nerves retire themselves towards their originall, and thereby cause a pain like to convulsions; for as *Galen* writes in his book, *De motu musculorum*, that contraction is the true and proper action of a nerve and muscle: and again, extension is not so much an action as a motion:) now we must indeavour to give remedy to this symptome. Which may be done by anointing the spine of the back and all the affected part with the following Liniment, which is very powerful against Convulsions, the Palsie, numness and all cold effects of the nervous bodies. R *salviæ, chamæpytheos, majoranæ, rorismar. menth. rutæ, lavendulæ, an. m. j. flor. chamæmel. melilot. summit. aneth. & hyperici, an. p. ij. baccarum lauri & juniperi an.* ℥ij. *radicis pyrethri* ℥ij. *mastic. asse odorat. an.* ℥iß. *terebinth. venet.* ℔. j. *olei lumbr. aneth. cetell. an.* ℥vj. *olei terebinth.* ℥iij. *axung. hum.* ℥ij. *croci* ℈j. *vini albi odoriferi lib. j. ceræ quantum sufficit, contundenda contundantur, pulverisanda pulverisentur, deinde macerentur omnia in vino per noctem, postea coquantur cum oleis & axungia prædictis in vase duplici, fiat linimentum secundum artem. in fine adde aquæ vitæ* ℥iiij. Besides, in dressing these wounds, the Chirurgeon must use diligence to procure the falling away of the ends or scales of the bones, which the saw and the appulse of the air never before coming hereto, have tainted; which may be done by applying to their ends actuall cauteries, that is, hot irons, in using of which you must have a speciall care that you touch not the sensible parts with fire; neither must the bones themselves be forcibly pluckt off, but gently moved by little and little, so that you shall think you and the Patient have exceedingly well performed your parts if they fall away at the thirtieth day after the Amputation. All these things being performed, you shall hinder the growth of proud flesh with the cathæreticks, such as are burnt vitrioll, the powder of Mercury, and other things, amongst which is Alum burnt and powdered, which is excellent in these kind of wounds, whether by it self or mixed with others. You shall use these and such like, even unto the perfect agglutination and cicatrization of the wound, and you may of your self devise other things, such as these; as occasion shall offer its self.

An emplastick powder.

Detersives.

VVhy after dismembring the Patients complain of pain as if the part were yet remaining on.

An ointment for the spine of the back against all affects of the nerves.

How to procure the falling away of the ends of the bones.

Cathæreticks.

CHAP. XXIIII. *What just occasion moved the Author to devise this new form of remedy, to stanch the blood after the amputation of a member, and to forsake the common way used almost by all Chirurgeons; which is, by application of actuall cauteries.*

VErily I confess, I formerly have used to stanch the bleeding of members after amputation, after another manner than that I have a little before mentioned. Whereof I am ashamed, and agrieved; But what should I do? I have observed my masters whose method I intended to follow, alwaies to do the like; who thought themselves singularly well appointed to stanch a flux of blood, when they were furnished with various store of hot Irons and caustick medicins, which they would use to the dismembred part, now one, then another, as they themselves thought meet. Which thing cannot be spoken, or but thought upon without great horror, much lesse acted. For this kind of remedy could not but bring great and tormenting pain to the Patient, seeing such fresh wounds made in the quick and sound flesh are endued with exquisite sense. Neither can any caustick be applyed to nervous bodies, but that this horrid impression of the fire will be presently communicated to the inward parts, whence horrid symptomes ensue, & oft-times death it self. And verily of such as were burnt, the third part scarse ever recovered, and that with much adoe, for that combust wounds difficultly come to cicatrization; for by this burning are caused cruell pains, whence a Feaver, Convulsion, and oft-times other accidents worse than these. Adde hereunto, that when the eschar fell away, oft-times a new hæmorrhage ensued, for stanching whereof they were forced to use other caustick and burning Instruments. Neither did these good men know any other course; so by this repetition there was great losse and waste made of the fleshy and nervous substance of the part. Through which occasion the bones were laid bare, whence many were out of hope of cicatrization, being forced for the remainder of their wretched life to carry about an ulcer upon that part which was dismembred; which also took away the opportunity of fitting or putting to of an artificiall leg or arm in stead of that which was taken off. Wherefore I must earnestly entreat all Chirurgeons, that leaving this old, and too too cruell way of healing, they would embrace this new, which I think was taught me by the speciall favour of the sacred Deity, for I learnt it not of my masters, nor of any other, neither have I at any time found it used by any. Only I have read in *Galen*, that there was no speedier remedy for stanching of blood, than to bind the vessells through which it flowed towards their roots, to wit, the Liver, and Heart. This precept of *Galen*, of binding and sowing the Veins and Arteries in the new wounds, when as I thought it might be drawn to these which are made by the amputation of members, I attempted it in many; yet so that at first in my budding practise thereof, I alwayes had my cauteries and hot Irons in a readinesse,

Hot Irons not to be used.

Lib. 5. Meth.

that if any thing happened otherwiſe then I expected in this my new work, I might fetch ſuccour from the ancient practice, untill at length confirmed by the happy experience of almoſt an infinite number of particulars, I bid eternally adieu, to all hot Irons and cauteries which were commonly uſed in this work. And I think it fit that Chirurgeons do the like. For antiquity and cuſtome in ſuch things as are performed by Art, ought not to have any ſway, authority or place contrary to reaſon, as they ott-times have in civill affaires; wherefore let no man ſay unto us, that the Ancients have alwayes done thus.

CHAP. XXV. *The practiſe of the former precepts is declared, together with a memorable hiſtory of a certain ſouldier, whoſe arm was taken off at the Elbow.*

A Hiſtory.

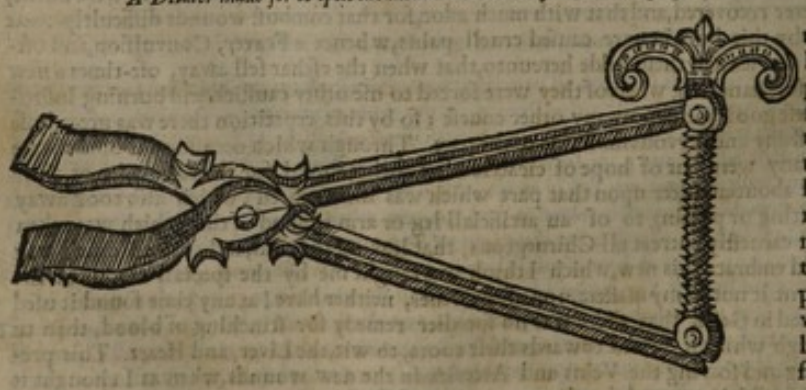
I Think it fit to confirm by an example the preſcribed method of curing a Gangrene and Mortification. Whilſt I was Chirurgeon to the Marſhall of *Montejan* at *Turin*, a certain common ſouldier received a wound on his wriſt with a musket bullet, by which the bones and tendons being much broken, and the nervous bodies cruelly torn, there followed a Gangrene and at length a mortification even to the Elbow; beſides alſo an inflammation ſeiſed upon the middle part of his Cheſt, and there was as it were a certain diſpoſition to a Gangrene, whereby it followed that he was painfully and dangerouſly troubled with belchings, hickettings, watchings, unquietneſſe and frequent ſwoundings, which occaſioned many Chirurgeons to leave him as deſperate. But it ſo fell out, that I orecome by his friends intreaty, undertook the cure of this wretched perſon, deſtitute of all humane help. Wherefore knowing the mortification by its ſigns, I cut off the arm by the elbow as ſpeedily as I could, making firſt the ligature, whereof I made mention; I ſay I took it off not with a ſaw, but only with an inciſion knife, cutting in ſunder the ligaments which held the bones together, becauſe the ſphacell was not paſſed the joint of the Elbow. Neither ought this ſection to be counted ſtrange, which is made in a joint; for *Hippocrates* much commends it, and ſaith that it is eaſily healed, & that there is nothing to be feared therein beſides ſwounding, by reaſon of the pain cauſed by cutting the common tendons & ligaments. But ſuch inciſion being made, the former ligature could not hinder, but much blood muſt flow from thence, by reaſon of the large veſſels that run that way. Wherefore I let the blood to flow plentifully ſo to disburden the part, and ſo afterwards to free it from the danger and fear of inflammation and a Gangrene; then preſently I ſtanched the blood with an hot Iron, for as yet I knew no other courſe. Then gently looſing the ligature I ſcarifie that part of the brawn of the Arm which was gangrenated, with many and deep inciſions, ſhunning and not touching the inner part, by reaſon of the multitude of the large veſſels and Nerves which run that way; then I preſently applyed a cautery to ſome of the inciſions, both to ſtanch the bleeding, and draw forth the virulent *ſanies* which remained in the part. And then I aſſailed and overcame the ſpreading putrefaction by putting and applying the formerly preſcribed medicins; I uſed all ſorts of reſtrictive medicins, to ſtay the inflammation of the Cheſt; I alſo applyed Epithema's to the region of the heart, and gave him cordial potions and boles, neitheir did I deſiſt from uſing them untill ſuch time as his belching, hicketting and ſwoundings had left him. Whilſt I more attentively intended theſe things, another miſchief aſſails my Patient, to wit, Convulſions, and that not through any fault of him or me, but by the naughtineſſe of the place wherein he lay, which was in a Barn every where full of chinks and open on every ſide, and then alſo it was in the midſt of winter raging with froſt and ſnow and all ſorts of cold; neither had he any fire or other thing neceſſary for preſervation of life, to leſſen theſe injuries of the air and place; Now his joints were contracted, his teeth ſet, and his mouth and face were drawn awry, when as I pitying his caſe made him to be carried into the neighbouring Stable which ſmoaked with much horſe dung, and bringing in fire in two chafendiſhes, I preſently anointed his neck and all the ſpine of his back, ſhunning the parts of the Cheſt, with liniments formerly deſcribed for convulſions; then ſtraight way I wrapped him in a warm linnen cloth, and buried him even to the neck in hot dung, putting a little freſh ſtraw about him; when he had ſtayed there ſome three dayes, having at length a gentle ſcouring or flux of his belly, and plentifull ſweat, he begun by little and little to open his mouth and teeth which before were ſet and cloſe ſhut. Having got by this means ſome opportunity better to do my buſineſſe, I opened his mouth as much as I pleaſed, by putting this following Inſtrument between his teeth.

Diſmembring at a joint.

Gell. 4. Lib. de Art.

Burying in hot horſe dung helps Convulſions.

A Dilater made for to open the mouth and teeth by the means of a ſcrew in the end thereof.



Now drawing out the Inſtrument I kept his mouth open by putting in a willow ſtick on each ſide therof, that ſo I might the more eaſily feed him with meats ſoon made, as with Cows milk and rear egs, untill he had recovered power to eat, the convulſion having left him. He by this means freed from the Convulſion, I then again begun the cure of his arm, and with an actuall cautery ſear the end of the bone, ſo to dry up the perpetuall

petuall afflux of corrupt matter. It is not altogether unworthy of your knowledg, that he said, how that he was wondrously delighted by the application of such actuall cauteries, a certain tickling running the whole length of the arm by reason of the gentle diffusion of the heat by the applying the caustick; which same thing I have observed in many others; especially in such as lay upon the like occasion in the Hospitall of *Paris*. After this cauterizing there fell away many and large scales of the bone, the freer appulse of the air than was fit making much thereto; besides when there was place for fomentation, with the decoction of red Rose leaves, Wormwood, Sage, Bay leaves, flowers of Camomil, Melilote, Dill, I so comforted the part that I also at the same time by the same means drew and took away the virulent *Sanies*, which firmly adhered to the flesh and bones. Lastly, it came to passe, that by Gods assistance, these means I used, and my carefull diligence, he at length recovered. Wherefore I would admonish the young Chirurgeon, that he never account any so desperate, as to give him for lost, content to have let him go with prognosticks; for as an ancient Doctor writes; that as in Nature, so in diseases there are also Monsters.

A fomentation for a Convulsion.

Monsters or miracles in diseases.

The End of the Twelfth Book.

Of Ulcers, Fistula's, and Hæmorrhoides.

THE THIRTEENTH BOOK.

CHAP. I. *Of the nature, causes and differences of Ulcers.*

HAving already handled and treated of the nature, differences, causes, signs and cure of fresh and bloody wounds, reason and order seem to require that we now speak of Ulcers; taking our beginning from the ambiguity of the name. For according to *Hippocrates*, the name of Ulcer most generally taken may signifie all or any solution of Continuity; In which sense it is read that all pain is an Ulcer. Generally, for a wound and Ulcer properly so called; as appears by his Book, *de Ulceribus*. Properly, as when he saith, it is a sign of death when an Ulcer is dryed up through an *Atrophia*, or defect of nourishment. We have here determined to speak of an Ulcer in this last and proper signification. And according thereto we define an Ulcer to be the solution of Continuity in a soft part, and that not bloody, but sordid and unpure, flowing with quitture, *Sanies* or any such like corruption, associated with one or more affects against nature, which hinder the healing and agglutination thereof; or that we may give you it in fewer words according to *Galens* opinion; An ulcer is a solution of Continuity, caused by Erosion. The causes of Ulcers are either internall or externall. The internall are through the default of humors peccant in quality rather than in quantity, or else in both, and so making erosion in the skin and softer parts by their acrimony and malignity; now these things happen either by naughty and irregular diet, or by the ill disposition of the entrails, sending forth and emptying into the habit of the body this their ill dispositure. The externall causes are, the excesse of cold seising upon any part, especially more remote from the fountain of heat, whence follows pain, whereunto succeeds an attraction of humors and spirits into the part, and the corruption of these so drawn thither by reason of the debility or extinction of the native heat in that part, whence lastly ulceration proceeds. In this number of externall causes may be ranged, a stroak, contusion, the application of sharp and acrid medicins, as caustick, burns; as also impure contagion, as appears by the virulent ulcers acquired by the filthy copulation or too familiar conversation of such as have the *French* disease. How many and what the differences of Ulcers are, you may see here described in this following Scheme.

The divers acceptions of an Ulcer. *Sent. 34. sect. 3. lib. de fract.*

Sect. 1. prog.

What an Ulcer properly is. *Lib. de constit. Artis cap. 6.*

The internall causes.

The externall causes.

A Table of the differences of Ulcers.

An Ulcer is an impure solution of continuity in a soft part, flowing with filth and matter or other corruption, whereof there are two chief differences; for one

- *Is simple and solitary without complication of any other affect against nature, and this varies in differences; either*
  - *Proper, which are usually drawn from three things; to wit,*
    - *Figure, whence one Ulcer is called*
      - *Round or circular.*
      - *Sinuous, and variously spread.*
      - *Right or oblique.*
      - *Cornered as triangular.*
    - *Quantity, and that either according to their*
      - *Length; whence an Ulcer is long, short, indifferent.*
      - *Breadth; whence an Ulcer is broad, narrow, indifferent.*
      - *Profundity; whence an Ulcer is deep, superficiary, indifferent.*
    - *Equality or inequality; which consists*
      - *In those differences of dimensions whereof we last treated, I say in length, breadth and profundity, wherein they are either alike or of the same manner, or else unlike and so of a different manner.*

- *Or common and accidentall, and theſe drawn, either*
  - *From their time; whence an Vlcer is tearmed new; old, of ſhort or long cure and duration.*
  - *From their appearance; whence one is called an apparent Vlcer; another a hidden and occult Vlcer.*
  - *From their manner of generation; as if it be made by a heavy, bruiſing, cutting, pricking or corroding thing; whence a cut, torn and mixt Vlcer.*
  - *From their ſite; whence an Vlcer before, behind, above, below, in the head, tail, or belly of a Muſcle.*
  - *From that part it ſeiſes upon, whence an Vlcer in the fleſh and skin, or feeding upon the griſtles or bones, ſuch as theſe of the noſe, the palat of the mouth, and ears.*
  - *From other common accidents; whence a Telephian Vlcer; that is, ſuch an Vlcer as Telephus had. A Chironian, which needs the hand and art of Chiron. A Canckrous, which reſembles a Cancer.*
- *Is compound and many and various wayes complicated, as*
  - *With the cauſe, whence an Vlcer* — *Is Cacochymick, Catarrhoick or venenate, that is, which a Cachochymia or Repletion of ill humors, a Catarrh, or poiſon cheriſhes or feeds.*
  - *With the diſeaſe, as from*
    - *Diſtemper whether ſimple or compound, whence an Vlcer is* — *Hot. Cold. Dry. Moiſt. Mixt.*
    - *Swelling or Tumor, whence a* — *Phlegmonous, Erysipelous, Oedematous, Scirrhous, Cancrous* — *Vlcer.*
    - *Solution of continuity, or any other diſcommodity, whence a rough, callous, fiſtulous, cavernous, ſinuous Vlcer, with luxation, fracture, &c.*
  - *With the Symptome, whence, a corroding, eating, painfull, ſordid and virulent Vlcer.*
  - *With the cauſe and diſeaſe,*
  - *With the cauſe and Symptome,*
  - *With the diſeaſe and Symptome,*
  - *With the cauſe, diſeaſe, and Symptome.*

  — *Examples whereof may be taken from that we have formerly delivered.*

CHAP. II. *Of the ſigns of Vlcers.*

The ſigns of a putrid Vlcer.

THere are various ſigns of Vlcers according to their differences. For it is the ſign of a putrid Vlcer, if it exhale a noyſome, grievous, ſtinking and carion-like vapour, together with filthy matter. An eating Vlcer is known by the eating in, hollowneſſe and wearing away of the part wherein it reſides, together with the adjoining parts. A ſordid Vlcer may be known by the groſneſſe and viſcidity of the excrements it ſends forth, and by the looſe and ſpongy ſoftneſſe, or the cruſted inequality of the fleſh which grows over it. A cavernous Vlcer, by the ſtraitneſſe of the orifice, and largeneſſe and deepneſſe of the windings within. A fiſtulous Vlcer, if to the laſt mentioned ſigns there accrew a callous hardneſſe of the lips or ſides of the Vlcer. A cancrous Vlcer is horrible to behold with the lips turned back, hard and ſwoln, flowing with virulent and ſtinking corruption, and ſometimes alſo with bloody matter, together with the ſwelling and lifting up of the adjacent veins. An untemperate, or as they term it, a diſtempered Vlcer, is ſuch as is nouriſhed by ſome great diſtemper whether hot or cold, moiſt or dry, or compounded of theſe. An ill * natured or malign Vlcer is known by the difficulty of curing and rebellious contumacy to remedies appointed according to Art and reaſon. We know a catarrhous Vlcer, if the matter which feeds it flow to it from ſome *varices* thereunto adjoining, or dilated, ſwollen and broken veins, or from ſome entrail; or from the whole body being ill affected. An Apoſtumatous Vlcer is perceived by the preſence of any tumor againſt nature, whoſe kind may be found out by ſight and handling. *Telephian* Vlcers, are ſuch as affected *Telephus*, and *Chironian* (in whoſe cure *Chron* excelled) are Vlcers which may be known by their magnitude not much putrid, and conſequently not ſending forth any ill ſmell, not eating, not tormenting with pain, but having their lips ſwoln and hard, and therefore ill to be healed. For although they may be ſometimes cicatrized, yet it being but ſlender may eaſily be broken, and the Vlcer renewed. They are almoſt like an ulcerated Cancer, but that they are accompanied with ſwelling in the adjacent parts; they are alſo worſe than theſe which are termed *Cacoethe*, that is, ill natured, or malign; whence it is that *Fernelius* thought they had a hidden cauſe of malignity, beſides the common default of the humor, and that ſuch as can ſcarſe be driven away; ſuch commonly are felt after the plague. Wherefore *Galen* thinks ſuch to be malign as will not ſuppurate or yeeld any quitture.

*Gal. cap. 5. lib. 4. Meth. * Vlcus cacoethes.*

Comad. aphor. 22. ſect. 5.

CHAP. III. *Of the Prognoſticks of Vlcers.*

Aph. 45. ſect. 6.

THe bone muſt neceſſarily ſcale, and hollow ſcars be left by malign Vlcers of a years continuance or longer, and rebellious to medicins fitly applyed. The bone muſt ſcale by reaſon of the continuall afflux, and wearing by the acrimony of the humor, which looſes the compoſure and glue by which the parts thereof are joined together. But the ſcars muſt become hollow, for that the bone (whence all the fleſh takes its firſt originall) or ſome portion thereof, being taken from under the fleſh, as the foundation thereof, ſo much of the bulk of the

fleſh

flesh must necessarily sink down, as the magnitude of the portion of the wasted bone comes unto.

You may know that death is at hand, when the Ulcers that arise in or before diseases, are suddainly either livid or dryed, or pale and withered. For such driness sheweth the defect of nature, which is not able to send the familiar and accustomed nutriment to the part ulcerated. But the livid or pale colour is not only an argument of the overabundance of choler and melancholy, but also of the extinction of the native heat. In Ulcers where tumors appear, the patients suffer no convulsions, neither are frantick, for the tumor being in the habit of the body possessed with an Ulcer, argues that the nervous parts and their originall are free from the noxious humors. But these tumors suddainly vanishing and without manifest cause, as without application of a discussing medicin, or bleeding, those who have them on their backs have convulsions and distensions, for that the spine of the back is almost wholly nervous; but such as have them on their fore parts, become either frantick, or have a sharp pain of their side, or pleurisie, or else a dysentery if the tumors be reddish; for the forepart of the body is replenished and overspread with many and large vessells, into whose passages the morbifick matter being translated, is presently carryed to these parts which are the seats of such diseases. Soft and loose tumors in Ulcers are good, for they shew a mildness and gentleness of the humors, but crude and hard swellings are naught; for all digestion in some measure resembles elixation. Ulcers which are smooth and shining are ill, for they shew that there resides an humor malign by its acrimony, which frets asunder the roots of the hairs, and depraves the naturall construction of the pores of the skin; whence it is that such as are troubled with Quartain agues, the Leprosie or *Lues venerea*, have their hair fall off. A livid flesh is ill in Ulcers which cause a rottenness or corruption of the bones lying under the flesh; for it is an argument of the dying heat and corruption of the bone, whence the flesh hath its originall & integrity.

Hip. progn. lib. 1. cap. 8. Aph. 55. sect. 5.

Aph. 97. sect. 5.

Aph. 4. sect. 6.

These Ulcers which happen by occasion of any disease, as a Dropsie, are hard to be cured; as also those whereinto a *varix* or swoln vessell continually casts in matter; which a present distemper foments; which have swoln, hard and callous lips; and such as are circular or round. An *Hypersarcosis*, or fleshy excrescence usually happens to Ulcers not diligently mundified; and if they possess the arms or Legs, they cause a Phlegmon or some other tumor in the groins, chiefly if the body be full of ill humors, as *Avicen* hath noted. For these parts by reason of their rarity and weakness are fit and subject to defluxions. *Albucrasis* writes that for nine causes Ulcers are difficultly replenished with flesh and cicatrized. The first for want of blood, in a bloodlesse body; the second by reason of ill humors and the impurity of the blood; the third by the unfit application of unconvenient medicins; the fourth by reason of the sordidness of the Ulcer; the fifth by the putrefaction of the soft and carion-like flesh encompassing the Ulcer; the sixth when they take their originall from a common cause which every where rages with fury, such as are those which are left by the pestilence; the seaventh by reason of the callous hardness of the lips of the Ulcer. The eighth when the heavens and air are of such condition as ministers fuell to the continuance of the Ulcer, as at Sarogoza in Aragon; the ninth when the bones which lye under it are wasted by rottenness. An Ulcer that casts forth white, smooth, equall quitture, and little or no stinking, is easily healed; for it argues the victory of the native heat, and the integrity of the solid parts. We terme that smooth quitture which is absolutely concocted, neither yeelds any asperity to the touch, whereby we might suspect that as yet any portion of the humor remains crude; we call that equall wherein you can note no diversity of parts; & white not that which is perfectly so, but that which is of an ash colour, as *Galen* observes. But it is ill, if when the cure is indifferently forward, a flux of blood suddainly break forth in those Ulcers which beat strongly by reason of the great inflammation adjoyned therewith. For as *Hippocrates* observes, an effusion of blood happening upon a strong pulsation in Ulcers is evill; for the blood breaking out of an Artery cannot be stayed but by force; and also this blood is so furious by reason of the heat and inflammation the nourishers of this Ulcer that it breaks its receptacles, and hence ensues the extinction of the native heat, whence the defect of suppuration and a Gangrene ensues. Now for that there flowes two sorts of excrements from malign Ulcers, the more thin is tearmed *Ichor* or *sanies*, but the more grosse is named *sordes*; that is virulent and flowes from pricked nerves, and the *periostea* when they are evill affected; but the other usually flowes from the Ulcers of the joints, and it is the worser if it be black, reddish, ash-coloured, if muddy or unequall like wine Lees, if it stink. *Sanies* is like the water wherein flesh hath been washed; it argues the preternaturall heat of the part, but when it is pale coloured, it is said to shew the extinction of the heat.

Hip. Lib. de Ulc. Gal. cap. 2. & 5. lib. Meth. 4.

For what causes Ulcers are hard to heal.

What pus or matter is smooth, equall and white.

Aphorism. 22. sect. 2. de sect.

Aph. 21. sect. 7.

Two sorts of excrements flow from a malign Ulcer.

CHAP. IV. *Of the Generall cure of Ulcers.*

AN Ulcer is either simple or compound. A simple Ulcer, as an Ulcer hath one and that a simple indication, that is, exsiccation; and that more than in a wound, by how much an Ulcer is moister than a wound. There are many indications proposed for the cure of a compound Ulcer, in respect of which *Galen* would have us to keep this order, that we have the first regard of the most urgent, then of the cause, then of that, which unlesse it be taken away, the Ulcer cannot be healed. By giving you an example you may easily understand the meaning hereof. Imagin on the inside of the Leg a little above the ancle, an Ulcer very painfull, hollow, putrid, associated with the rottenesse of the bone, circular, having hard and swoln Lips, and engirt with the inflammation and *varices* of the neighbouring parts. If you take this to cure, before you do any thing about the Ulcer, unlesse you be called upon by that which urges, as by vehemency of pain, you must first use generall means by calling and advising with a Physitian; For in *Galens* opinion, if the whole body require a preparation, then must that be done in the first place; for in some Ulcers purgation only will be sufficient; in some blood-letting; others are better by using both means, which is as the cause of the Ulcer proceeds from a repletion

The curing of a simple Ulcer consists in exsiccation. *Gal. 7. Meth. cap. 12.*

Gal. lib. 4. de compound. secundum gen.

repletion or ilneſſe of humors. Now by theſe means having taken away the cauſe of the Vlcer, you muſt come to the particular cure thereof, beginning with that which is moſt urgent. Wherefore you muſt firſt aſſwage the pain by application of things contrary to the cauſe thereof, as if it proceed from a Phlegmonous diſtemper, which hath long poſſeſt, diſtended and hardned the part, it muſt be eaſed by evacuation. Firſt, bathing it with warm water, to mollifie and relax the skin, that ſo you may the more eaſily evacuate the contained humors; then ſhall you draw away portion of the matter cauſing the ſwelling and pain by ſcarification, if the Patient ſhall be of ſufficient courage, or elſe by application of horſe-leaches if he be more faint-hearted; and then you ſhall temper the heat thereof by applying *Vnguentum refrigerans Galeni*. To conclude, you ſhall attempt all things which we have formerly delivered (in our treatiſe of Tumors) to take away the ſwelling thereof. When you have brought this to that paſſe you deſire, you ſhall come to thoſe which are ſuch, that it cannot be taken away or healed without them, which ſhall be done by orderly helping the defects againſt nature which were conjoined with the Vlcer, to wit, the rottenneſſe of the bone, which you ſhall help by actuall cauteries; and in the mean while you ſhall draw the Vlcer into another form, to wit, cornered, and you ſhall cut away the callous hardneſſe, and help the rottenneſſe. Then muſt you procure the falling away of the Eſchar, and then provide for the ſcaling of the bone by the means formerly preſcribed, laſtly the mundified Vlcer muſt be filled with fleſh. For generating of fleſh two cauſes muſt concur, the efficient, and materiall; The efficient is, the good temper both of the whole body, as alſo of the Vlcerated part. For this prevailing, there will be an attraction, digeſtion, oppoſition and aſſimilation of the laudable juice to the part affected; verily the laudable temper is preſerved by like things, but the vicious is amended by contraries. The matter to be ſpent upon fleſh is laudable blood, which offends neither in quality, nor quantity. In this regeneration of the fleſh there appear two kinds of excrements, the one more thin and humid called *Sanies*, the other more groſſe termed *Sordes*. Both of theſe for that they are contrary to nature, do therefore hinder the regeneration of fleſh, and therefore muſt be taken away by applying their contraries, as by things drying in the firſt degree, and more ſtrongly or weakly detergent, according to the complexion of the part and the whole body, and the plenty and quality of the excrementitious humor, and the uncleanneſs of the Vlcer. For the part muſt be preſerved by the uſe of the like, but the Vlcer orecome by application of things contrary thereto. After that by natures endeavour and the Chirurgeons help the ulcer is replete with fleſh, it muſt be cicatrized, that is, covered with a callous skin in ſtead of the true and native skin. It may be cicatrized by ſtrewing of very drying powders having very little or no acrimony. Thus Alum and Vitrioll being burnt & made into powder, and thinly ſtrewed upon the part do quickly cicatrize the former fleſhy work. To this purpoſe alſo ſerve, the root of *Ariſtolochia*, Aloes, burnt Lead, Pomegranat pills burnt, Litharge, *Tutia*, and alſo plates of Lead beſmeared with quickſilver, whoſe efficacy for this purpoſe Chirurgeons ſometimes find more certain and powerfull than any other remedies.

The things conducing to the generating of fleſh.

What a Scar is.

Things cauſing cicatrization.

CHAP. V. *Of a diſtempered Vlcer.*

Signs of a diſtempered ulcer.

BEfore we ſpeak of a diſtempered ulcer, it is meet, leſt that the Chirurgeon take one diſtemper for another, briefly to relate the ſigns of each. You may know that an ulcer is aſſociated with a dry diſtemper by your ſight, as if the ulcer be as it were wrinkled, if it ſend forth little or no moiſture; alſo it is known by touch, if it feel rough and hard. You ſhall correct this diſtemper by humecting medicins, as fomenting it with warm water according to *Galens* opinion, or elſe with *Hydreleum* (*i.*) Oil and water mixt, but alwayes you muſt firſt purge, if the body ſhall abound with ill humors, or uſe Phlebotomie if the body be plethorick; otherwiſe you ſhall draw more humors into the part than it can bear. Now you ſhall ſo long foment it, untill the fleſh which is about it begin to look red, wax ſoft and moiſt, and the part it ſelf be a little ſwoln. If you proceed further, you will reſolve all the humor which you have drawn thither, and ſo your labour is in vaine. After the fomentation apply ſuch a remedy to the ulcerated part. ℞. *cremoris hordei* ℥ij. *ſol. malvæ in aq. coſt.* ℥j. *pingued. porci* ℥iſ. *meſſis com.* ℥ß. *miſce in mortario & fiat unguentum.*

Remedies for a dry diſtempered ulcer.

Signs of too moiſt an ulcer.

You ſhall know a moiſt diſtemper aſſociates the ulcer by the plenty of the excrementitious humor, which the ulcer ſends forth, by the ſpongy and fungous ſoftneſſe and growth of the fleſh about it. You ſhal amend this by drying remedies, ſuch as theſe are, which we tearm ſarcoticks, having alwayes regard to the plenty of the humor, the proper temper of the part, and other indications formerly mentioned. Amongſt other remedies *Galen* much commends Alum water, for it dries, clenſes and corroborates the affected part. Alſo this enſuing fomentation may be applyed to good purpoſe. ℞. *roſar. rub. abſinth. beton. tapſi barbati an. m.* j. *gallarum, nucum cupreſſi, an.* ℥ij. *aluminis rochæ* ℥j. *fiat decoctio in vino auſtero, inſtituatur fotus.* Then let *Empl. de ceruſſa* or *De minio* be applyed to the ulcer. Alſo I have found by experience that the powder of burnt alum lightly ſtrewed upon the ulcer is very effectuall in this caſe. You ſhal know that an hot diſtemper aſſociates the ulcer by redneſs, or yellowneſſe thereof, by the heat manifeſt to your touch, and the propriety of your pain. Then muſt you have recourſe to refrigerating things, ſuch as *ung. Roſatum Meſ. Refrigerans Gal. Populeon*; ſtoops and clothed dipped in Plantain water, Night-ſhade water, or Oxycrate. I have oft found by experience that ſcarification, or Leaches being applyed, did more conduce than any other remedy. For ſo the chafed blood, which by that means is apt to corrupt, is drawn away, and the part it ſelf is alſo freed of that burden.

Gal. lib. 1. ſimp. cap. 7.

Signs of a hot diſtempered ulcer.

Signs of a cold diſtempered ulcer.

We know a cold diſtemper by the whitiſh or pale colour, by the touch of the Chirurgeon, and ſpeach of the Patient complaining of the coldneſſe of the ulcerated part. You ſhall correct this by applying and putting bottles filled with water about the part, or elſe ſwines bladders half filled with the following decoction. ℞. *origani, pulegii, chamæm. meliloti, an. m.* j. *abſinth. majoranæ, ſalviæ, rorifmar. an. m.* ß. *fiat.*

decoctio

decoctio in vino generoso, addendo aquæ vitæ quod sufficit. Also the Ulcer may be conveniently fomented with spunges dipped in the same decoction, and let there be applyed thereto *Empl. Oxycroceum; emp. de meliloto; de Vigo cum mercurio*, and *sine mercurio*. But if a mixt and compound distemper be joined to the Ulcer, the medicins must in like manner be mixt and composed. The residue of the Chirurgeons care and pains must be spent upon the proper and peculiar cure of the Ulcer, as it is an Ulcer; which we said in the former Chapter was contained in detersion, regenerating flesh and cicatrization thereof.

CHAP. VI. *Of an Ulcer with pain.*

HEre oft-times so great pain accompanieth Ulcers, that it calls thereto the counsell of the Physitian. Wherefore if it proceed from any distemper, it shall be taken away by remedies proper against that distemper, such as we mentioned in the former Chapter. But if it do not so cease, we must go on to Narcoticks. Such are cataplasms of the leaves of Mandrakes, Water lillies, Henbane, Nightshade, Hemlock, the seeds of Poppy and oils of the same; to which also may be added *Opium*, *Populeon*, and other things of like faculties. But if a malign acrimony and virulency of an humor corroding and eating the flesh lying under it and the lips about it, cause and make the pain, you shall neither asswage it by anodynes, nor Narcoticks; for by application of gentle medicins it will become worse and worse. Wherefore you must betake you to Cathæreticks; For strong medicins are fittest for strong diseases. Wherefore let a pledget dipped in strong and more than ordinarily powerfull *Ægyptiacum*, or in a little oil of Vitriol, be applyed to the Ulcer; for these have power to tame this raging pain, and virulent humors. In the mean season let refrigerating things be put about the Ulcer, lest the vehemency of acrid medicins cause a defluxion.

The matter of Narcotick cataplasms.

Cathæreticks have power to asswage pain.

CHAP. VII. *Of Ulcers with overgrowing or proudnesse of flesh.*

ULcers have oft-times proud or overgrowing flesh in them, either by the negligence of the Chirurgeon, or fault of the Patient. Against this, drying and gently eating or consuming medicins must be applyed; such as are Galls, *cortex thuris*, Aloes, *Tutia*, Antimony, *Pompholix*, Vitriol, Lead, all of them burnt and washt if need require. Of these powders you may also make ointments with a little oil and wax; but if the proud flesh, as that which is hard and dense, yeeld not to these remedies, we must come to causticks, or else to iron, so to cut it off. For in *Galens* opinion, the taking away of proud flesh is no work of nature, (as the generating, restoring and agglutinating of the flesh is) but it is performed by medicins which dry vehemently, or else by the hand of the Chirurgeon; wherefore amongst the remedies fit for this operation, the powder of Mercury with some small quantity of burnt Alum, or burnt Vitriol alone, seem very effectuall to me. Now for the hard and callous lips of the Ulcer, they must be mollified with medicins which have such a faculty, as with Calves, Goose, Capons or Ducks grease, the oils of Lillies, sweet Almonds, Worms, Whelps, *Oesipus*, the mucilages of Marsh-mallows, Linseed, Fænugreek seed, Gum *Ammoniacum*, *Galbanum*, *Bdellium*, of which being mixed may be made Emplaisters, unguents, and liniments: or you shall use *Empl. Diachylon*, or *de Mucilaginibus*, *De Vigo cum mercurio*. To conclude, after we have for some few dayes used such like remedies, you may apply to the Ulcer a plate of Lead rubbed over with Quicksilver; for this is very effectuall to smooth an Ulcer and depresse the lips: if you shall prevail nothing by this means, you must come to the causticks, by which if you still prevail nothing, for that the lips of the Ulcer are so callous that the causticks cannot pierce into them, you must cleave them with a gentle scarification, or else cut them to the quick, so to make way, or as it were open a window for the medicin to enter in, according to *Galen*. Neither in the interim must you omit *Hippocrates* his advice, which is, that by the same operation we reduce the Ulcer if round, into another figure, to wit, long or triangular.

Things wasting superfluous flesh.

Lib. 3. Meth. cap. 6.

For the callous lips of Ulcers.

Lib. 4. Meth. cap. 2.

CHAP. VIII. *Of an Ulcer putrid and breeding Worms.*

WOunds are divers times bred in ulcers, whence they are called wormy ulcers; the cause hereof is the too great excrementitious humidity prepared to putrefie by unnaturall and immoderate heat. Which happens, either for that the ulcer is neglected, or else by reason of the distemper and depraved humors of all the body, or the affected part; or else for that the excrementitious humor collected in the ulcer, hath not open and free passage forth; as it happens to the ulcers of the ears, nose, fundament, neck of the womb, and lastly, to all sinuous & cuniculous ulcers. Yet it doth not necessarily follow that all putrid ulcers must have worms in them; as you may perceive by the definition of a putrid ulcer which we gave you before. For the cure of such ulcers after generall means, the worms must first be taken forth, then the excrementitious humor must be drawn away, whence they take their originall. Therefore you shall foment the ulcer with the ensuing decoction, which is of force to kill them; for if any labour to take forth all that are quick he will be much deceived; for they oft times do so tenaciously adhere to the ulcerated part, that you cannot pluck them away without much force and pain. R. *absinth. centaur-majoris, marrubii, an. M. j. fiat decoctio ad lb. ss. in qua dissolve aloes ℥ ß. unguenti ægyptiaci ℥j.* Let the ulcer be fomented and washed with this medicin, and let pledgets dipped herein be put into the ulcer; or else if the ulcer be cuniculous or full of windings, make injection therewith which may go into all parts thereof.

The cause of worms breeding in Ulcers.

A fomentation to kill the worms.

Achigenes much commends this following medicin. R. *Cerussæ, golii montani, an. ℥ß. picis navalis liquidæ quantum sufficit, misce in mortario pro linimento.* If the putrefaction be such that these medicins will not suffice for the amendment thereof, you must come to more powerfull, or to cauteries also, or hot Irons, or to

Gal. 4. comp. med.

to section; yet you must still begin with the more gentle, such as this of *Galens* description. R. *cer.* ʒij. *ceruse* ʒj. *olei ros.* ℥ij. *salis ammon.* ʒß. *squam æris* ʒij. *thur. alum. ærug. malicor. calcis vivæ, an.* ʒj. *fiat emplastrum.* Or R. *terebinth. lotæ* ʒij. *cer. albæ* ʒß. *liquefiant simul addendo sublimati,* ʒß. *salis torrefacti, & vitrioli calcinati, an.* ʒj. *fiat mundificativum.* Or you must use our *Ægyptiacum* alone, which hath Sublimate entring into the composition thereof; but in the interim the circuit of the Ulcer must be defended with refrigerating and defensative things for fear of pain.

CHAP. IX. *Of a sordid Ulcer.*

A Sordid Ulcer after the cure of the body in generall, shall be healed with detergent medicins, the indication being drawn from the grosse and tough excrement, which with the excrementitious *sanies*, as it were besieging, and blocking up the ulcerated parts, weakens and as it were dulls the force of medicins though powerfull, which causeth us to begin the cure with fomentations and lotions, as thus. R. *Lixivii com.* lb. j. *absinth. marrub. apii, centaur. utriusque, hypericonis, an. M. ff. exquantur, colatur. e, quæ sufficiat, adde mellis rosati* ʒj. *unguenti ægyptiaci* ʒß. *fiat fotus.* Then use the following detersive medicin: R. *succi appii, & plantag. an.* ʒij. *mellis com.* ʒj. *terebinth.* ʒiß. *pul. Ireos Florent. & aloes an.* ʒß. *fiat medicamentum.* The Chirurgeon must well consider, at how many dressings he shall be able to wash away the grosse *sordes* or filth sticking close to the Ulcer, and dry up the excrementitious *sanies*. For oft-times these things may be done at one dressing; but in others who have more quick sense or feeling, not so soon. But when the Ulcer is freed of such grosse *Sordes* or filth, you must forbear to use more acrid things for fear of pain, defluxion, inflammation, and erosion, whereby the Ulcer would become more hollow. Wherefore then we shall be content to apply remedies which dry and clense without acrimony that we may so help natures indeavours in generating flesh. Such remedies are the pouders of Aloes, Mastich, Myrrh, Orris, Litharge, Antimony, roots of Gentian, Barly flower, and the like, which being strewed upon the Ulcer, you shall cover it with Lint, and put over that a plate of Lead, rubbed over with quick silver; and you shall put on these detersives and desiccatives more or lesse strong, as you shall find it requisite and necessary. For the too plentifull use of drying and detersive things, doth in time hollow the Ulcers, whereby it comes to passe that in short time in like sort, a greater quantity of *Sanies* flows from the Ulcer, the proper substance of the flesh being dissolved by the force or acrimony of detersive medicin; as also the proper alimentary humor, which flowed to the part, being in the like sort, a greater quantity of *Sanies* flowed from the Ulcer, the proper substance of the flesh being dissolved by the force or acrimony of the detersive medicine, as also the proper alimentary humor, which flowed to the part, being in like sort defiled: which thing beguiles the unskilfull Chirurgeon. For by how much he sees the Ulcer flow more plentifully with *Sanies*, he endeavours by so much the more to exhaust and dry up with more acrid medicins these humidities as if they were excrementitious; But *Galen* hath long ago admonished us to take heed hereof, setting forth a History of a certain Emperick who dressing a sordid Ulcer with a green, acrid and eating medicin, dissolved the flesh, and so consequently made the Ulcer more hollow, and caused more pain and defluxion; whereby it happened that continually adding more acrid medicins, he continually by his ignorance and unskilfulnesse increased the colliquation of the flesh, the largenesse of the ulcer and excrementitious humidity. Wherefore we must take speciall care whether the sordid Ulcer grow each day worse, by its proper fault and the impurity of the whole body besides, or else by the colliquation of the flesh and corruption of the benign and alimentary humor sent thither for the nutrition of the part, by the too frequent and unskilful use of too acrid a medicin. You may conjecture this by the increase of the pain without reason, and by the heat and rednesse of the lips of the Ulcer. Therefore you must principally have regard to this, that you give each of your Patients his fit measure, that is, a convenient and agreeable medicin to each of their strengths, taking indication from the strength, distemper, and consistence of the whole body and affected part; for there is a great deal of difference whether you apply a medicin to a plowman or labourer, or to an Eunuch and woman, or whether to the Leg, or eyes. For these medicins which to a dense and hard body and part are only detergent and drying, the same are to delicate and tender bodies and parts cathæretick and eating, by colliquation of the flesh, and corruption of the nourishment, making an increase of *Sordes* or filth; on the contrary those things which do laudably and sufficiently clense the flesh in a soft body and dry up the *Sanies*, these same things applyed to a hard body encrease the *Sordes* and *Sanies* by suffering them to breed, neither are they of sufficient power to wash away the tenacious impurity of a dense body. Wherefore the skilfull Chirurgeon will see when he must betake himself from too strongly cleansing and eating medicins, to these which are more milde.

A detergent lotion.

Detergent medicins without acrimony.

A caution very observable in use of detergent things.

A distinction to be observed concerning the impurity of ulcers.

Diligent regard must be had of the patients bodies and the affected part.

CHAP. X. *Of a virulent, eating and malign Ulcer which is tearmed* Cacoethes, *and of a Chironian Ulcer.*

VIrulent and eating Ulcers differ not unlesse in *magis* and *minus*, for we tearm it a virulent Ulcer, which sends forth a virulent *sanies*, which is properly called *Virus*. This *Virus*, or virulency, when it becomes more malign, gnawes and feeds upon the parts which lye under, and are adjoyning to the Ulcer, and makes an eating Ulcer. Such Ulcers are by *Galen* called *Dysepulotica*, that is, difficultly to be cicatrized; for, saith he, it happens that the Ulcer is Dysepulotick, either for that the part affected may be vitiated either in the habit or temper thereof, so that it may corrupt the humor which flows thither; such an Ulcer is by a particular name tearmed *Cacoethes*; or for that by reason of the evill quality of the blood flowing thither and eating the part, the part affected being too moist cannot heal up. He further adds that a Chironian ulcer

How virulent and eating ulcers differ. Gal. lib. 4. de comp. med. sec. genera.

How a Chironian ulcer differs from an eating, see before, Cap. 2.

ulcer is far more malign than these Ulcers which are termed *Cacoethe*. For the cure; by reason that all these Ulcers have a large extent, for some are more malign and ill to be cicatrized than othersome; it is also necessary to have divers medicins ready and at hand distinct both in their faculties and the degrees thereof, so that it is no marvail if they oft fail of their purpose, who with the same medicin dresse and think they shall heale all malign Ulcers. This following medicin described by *Asclepiades* is much commended by *Galen*. ℞. *squamæ æris, æruginis, rasæ, an.* ℥j. *ceræ* ℔.ß. *resinæ laricis.* ℥iß. *quæ liquari possunt aridis affundantur*, and make an emplaster to be laid only upon the Ulcer; for you must lay a defensative about the Ulcer for fear of inflammation. But *Galen* saith, that the following Epulotick of *Primion* excels the rest, as that which to desperate Ulcers (which many have taken in hand and left as uncurable,) was of certain and approved use. ℞ *foreos* ℥iij. *aluminis scissilis, calcis vinæ, an.* ℥ij. *thuris gallarum, an.* ℥iiij. *ceræ.* ℔.j. & ℥iij. *sevi vitulini* ℔.j. & ℥vij. *olei veteris quantum sufficit, fiat emplastrum.*

Gal. lib. 4. see Gen. Cap. 5.

Gal. lib. 4. de comp. med. see Gen. Cap. 6.

CHAP. XI. *An advertisement to the young Chirurgeon touching the distance of times wherein malign Ulcers are to be dressed.*

TO shew the use of *Asclepiades* his medicins described in the former Chapter, and convince the error of these Chirurgeons, who think they do well for their Patients, if they twice or thrice on a day dresse malign ulcers; I have here thought good to digresse a little from my purpose and to interpose *Galens* authority. Rightly (saith *Galen*) hath *Asclepiades* added these words to the formerly described medicin: And loose this after three dayes, and foment the ulcer, and fasten the same emplaister being washed, and apply it again; for unlesse the medicin adhere long to the skin, it will do no good. Which thing notwithstanding many Physitians have been ignorant of, thinking if they wiped away the *sanies* from the ulcer thrice on a day, they should do better than those who did the same but twice a day. But those who dresse it but once a day, are reproved by the Patients as negligent. But they are much mistaken; for you must remember, as we have delivered in most of our writings, that the qualities of al neighbouring bodies do mutual actuate and affect each other in some degree, although the one thereof be much more powerfull; for by this reason in space of time they be come somewhat alike, though they otherwise differ much; But when the quality of the medicin shall be like the *species* to the body to be cured, there follows the better successe. Wherefore he which moved by these reasons first appointed to use the emplaister formerly applyed, is worthy of commendations; and we ought to follow him much the rather, seeing that which he found out by reason, is approved by experience. Neither did he unadvisedly command to foment the wound every third day, that is, every dressing; for seeing it is a powerfull medicin, therefore it stands in need of mitigation. Thus much *Galen*, whose opinion grounded on reason, he can again confirm with another reason. It is already sufficiently known, that medicins can do nothing in us unlesse by the force of the native heat, which stirs up the faculty of the medicin to operation. But in ulcers which are absolutely malign, the native heat of the affected part is very languid, being broken and debilitated by the presence of the preternaturall heat; so that it stands in need of a great space of time to actuate the vertue and faculty of the medicin. Wherefore, if in that time, when as the native heat hath much moved and stirred up the faculty of the medicin, the ulcer be loosed or opened, and that emplaister cast away which was laid upon the part, and a fresh one laid in stead thereof; the heat implanted in the part is either dissipated by the contact of the air, or is weakened and driven in; and that endeavour which was made by the emplaister was to no purpose, being as it were stopped in the midst of the course. But a new emplaister being laid on, the heat of the part must undergo a new labour, so to stir up the faculty to bring it to act.

Galens reason further explained.

For all medicins are, what they are, in faculty. Equall to this is their error, who by too oft renewing their emplaisters on the same day; do too powerfully clense; for so they do not only take away the excrementitious humors, both *sordes* and *sanies*, but also the alimentary juice; to wit, the *Rob*, *Cambium*, and *Gluten*, which are the next matter for procreating of laudible flesh. Wherefore it is not good to dresse ulcers so often in one day, and to loose them to apply new emplaisters, unlesse some greivous symptome (as pain) force us to do it, which requires to be asswaged and mitigated by the often changeing and renewing of Anodyne medicins.

Medicins are only such in faculty.

CHAP. XII. *How to bind up Vlcers.*

FOr the binding up of ulcers, you must alwayes begin your bandage at the ulcer. Now the Rowler must be so large that it may not only cover and comprehend the ulcer, but also some portion of the adjacent parts above and below; and let it presse the ulcer with that moderation, that it may only presse out the excrementition humors. For so the ulcer will become dry, and consequently more neer to healing, as it is observed by *Hippocrates*. Let this be the measure of your binding, that it be neither too strait for hence would ensue pain and defluxion; nor too lax, for such is of no use. You may moisten your boulsters and Rowlers in oxycrate or in red and astringent wine, especially in Summer; when you have bound it up the part must be kept quiet. For according to *Hippocrates*, those who have an ulcer in the leg, ought neither to stand, nor sit, but to lye on a bed. Wherefore when the legs are ulcerated the arms must be exercised, by handling, lifting up and casting downe of divers things. But on the contrary if the arms be ulcerated, the legs must be exercised with walking, or frictions from above downwards, if the Patient cannot endure to walk. So the humors and spirits which with more violence and greater plenty run down to the part affected, may be drawn back and diverted.

The beginning of your binding must be at the Ulcer. *Hip. lib. de ulc.*

Revulsion into contrary parts.

CHAP. XIII. *Of the cure of particular ulcers, and first of those of the eyes.*

4. *Metb.*

For that (in *Galens* opinion) the divers indication in curing diseases is drawn from the condition of the part, to wit, the temper, complexion, site, figure, use, dull or quick sense; Therefore having briefly handled the generall cure both of simple and compound and implicit ulcers, I think it fit to treat of them now as they are distinguished by the parts, beginning with these of the eyes. These according to *Celsus*, are sometimes caused by pustules, or a sharp defluxion which frets or eats in sunder the coats thereof, or else by a stroak.

Lib. 6. cap. 6. lib. 3. *Botryon.* *Calama.* *Argemon.* *Epicauma.*

Paulus sets down these differences of the ulcers of the eyes; If (saith he) a small, little and hollow ulcer be upon the horny coat, it is by the Greeks tearmed *Botryon*; but if it be broader and lesse deep, it is termed *Calama*; about the circle of the *Iris* or Rainbow, it is called *Argemon*. If it be crusty and sordid, it is termed *Epicauma*. These in generall require the same cure as the former, that is, to be mundified, incarnated, dryed and cicatrized; but the part affected indicates more gentle medicins. Wherefore having purged the Patient and taken some blood both from his arm, as also from his veins and temporall Arteries, and bathed him if it be needfull; to divert the defluxion you shall to his shoulders apply cupping glasses with scarification; or else bread newly drawn out of the oven, and sprinkled with *aquæ vitæ* or some good wine shall be applyed to the originall of the spinall marrow. But you shall apply to the forehead and temples an astringent emplaister made of *emplastrum contra rupturam, ung. Comitissæ,* and *resiccativum rubrum* mixed together. But this ensuing *Collyrium* described by *Celsus* and approved by *Hollerius*, shall be dropped into the eye. R. *æris usti, cadmiæ ustæ & lotæ, an.* ℥j. *ex aqua fingatur collyrium quod liquore ovi dissolvatur.* But in the mean time you must diligently observe whether you put the eye to any great pain. Wherefore now and then by putting anodyne medicins thereto, it will be good to comfort it. Also you may make *collyria* of the decoction of Plantain, fænugreek, wormwood, with a little quantity of Sugar-candy, *tutia*, gum *tragacanth*, myrrh and vitrioll dissolved therein. When the ulcer is mundified, the following sarcotick will be of good use. R. *sarcocollæ in lacte muliebri nutritæ,* ʒiij. *pul. diaireos simplicis, gum. arabici, tragacanth. an.* ʒß. *mucilaginis fænugraci quantum sufficit ut inde fiat collyrium.* But you must note that for moist ulcers, powders are more convenient than *Collyria*. When the ulcer is plained or filled with its proper flesh, it may be cicatrized with the following *collyrium*. R. *tutiæ, cadmiæ ut decet præparatæ, cerussæ, antimonii, olibani, an.* ʒß. *myrrhæ, sarcocollæ, sanguinis Draconis, aloes, opii, an,* ℈ß. *cum aqua plantaginis fiat collyrium*; or the powder only may be conveniently strewed thereon.

A Collyrium to clense the ulcers of the eyes.

A sarcotick Collyrium.

An epulotick Collyrium.

Lib. 6. cap. 6.

Celsus hath noted that the cicatrizing of the eyes is incident to two dangers, that is, lest they be too hollow, or else too thick. If too hollow, they must be filled by the following remedy, R *Papaveris lachrymæ,* ʒß. *sagapeni, opopanacis, an.* ʒß. *æruginis* ʒj. *cumini* ʒiij. *piperis* ʒij. *cadmiæ lotæ & cerussæ, an.* ʒjß. *cum aqua pluviali fiat collyrium.* But if the scars be thick or grosse, the following remedy will extenuate them. R *cinamon. acaciæ, an.* ʒß. *cadmiæ lotæ, croci, myrrhæ, papaveris lachrymæ, gum. arabici, an.* ʒj. *piperis albi, thuris, an.* ʒiß. *æris combusti,* ʒiij. *cum aqua pluviali fiat collyrium.* But if the scar be upon the *cornea* or horny coat, so that it cover the *pupilla* or sight, the sight will be intercepted by the denseness of the membrane. Here you must also observe, that the scars that are on the *Cornea* are white, but these on the *Adnata* are red, because this is spred over with more little veins than that.

A Collyrium for hollow scars.

The scars of the Horny coat are white, and these of the Adnata red.

CHAP. XIIII. *Of the* Ozæna *and Vlcers of the Nose.*

Lib. 6. cap. 8. Gal. lib. 3. de comp. med. secund. loc. cap. 3.

THe *Ozæna* is a deep and stinking ulcer in the inside of the nose, sending forth many crusty and stinking excrements. *Celsus* saith that such ulcers can scarsly be healed. It is caused (as *Galen* saith) by the distillation of acrid and putrid humors from the head into the nostrills about the mammillary processes. For the cure, the Patient must eat sparingly, and his meat must neither be sharp nor strong; the humor being prepared must be purged; the head dryed and strengthened, that so it may neither admit the excrementitious humors, nor send them down; then must we come to the part affected with the ulcer. The ulcer must be dryed with a repelling medicine, such as is the juice of Pomegranats boiled to the half in a brasse vessell; the powder of Calamint, Cresses, white Hellebore, the juice of Cresses with Alum and other things which you may read in *Celsus*. *Galen* out of *Archigenes* wishes, to draw up into the nostrills the juice of Calamint, or that the Calamint it self being dryed, and made into powder, may be blown with a quill into the nose. Others use this following powder.

The cure.

Lib. 20. epist. 5.

R *ros. rub. mint. calam. arom. red. angelicæ, gentian. macis, cariop. an.* ʒß. *camph. ambræ, an. gr.* iiij. *moscb. gr.* vj. *fiat pulvis subtilissimus. Manardus* writes that the Urine of an Asse, though a nasty medicine, is an excellent remedy in this affect. But if the inveterate and contumacious evill do not yeeld to these remedies, then you must have recourse to Coprose, Verdigreece, *sal ammoniacum*, and Alum with Vinegar. It divers times happens that the ulcer spreading on, comes to take hold of the *Ossa ethmoides* or sive-like bones; in which case you must not forcibly pluck them out, but refer the whole business to nature, and expect when they shall come away of themselves, making in the mean while injections into the nostrills of *aqua vitæ*, wherein Cephalick powders have been steeped for the greater drying.

An injection when the Ozæna shall come to the Ossa Ethmoidea.

CHAP. XV. *Of the Vlcers of the mouth.*

Aph. 24. sect. 3. Celsus lib. 6. cap. 11. Gal. com. ad 3. lib. epidem.

OF this tribe are the *Aphthæ*, ulcers familiar to little children, according to *Hippocrates*. They oft-times begin at the gums, and by the palat of the mouth creep into the *uvula*, throtle, and over all the mouth, as *Celsus* saith. *Galen* makes two kinds of *Aphthæ*; the one of easie cure, such as that which usually troubles children by reason of the acrimony of the nurses milk; the other is malign by reason of an afflux of an evill humor (that is, venenate and malign) into the mouth.

mouth. For the cure, it shall be good to abstain from all acrid things, and if it be a sucking child, it will not be amisse to temper the nurses milk with refrigerating meats, bathing the whole body, and fomenting the dugs with warm water; for all the members in children are most tender, and as it were mucous, and their mouths are unaccustomed to meats and drinks. For topick medicins, you must make choice of such which may quickly and readily work the effect; for here the condition of the affected part is such, that they cannot long remain and adhere thereto. Therefore if the ulcer be malign, it must be lightly touched with *aqua fortis* which hath been used in separating metalls and which besides is tempered with six parts of common water. You may for the same purpose use the oils of Vitriol, Sulphur, Antimony, Mercury water and the like. *Aetius* wishes you to touch and correct such ulcers with a lock of wooll dipped in scalding oil, and so fastned to the end of a probe, untill they wax white and become smooth or plain. For so their eating and spreading force will at length be bridled, and laudable flesh grow up in place of that which is eaten. After such burning it will be good to wash the mouth with the following gargarism, which also of its self alone will serve to cure Aphtha's, which are not malign. ℞ *hordei integri p.j. plantag. ceterach, piloselle, agrimoniæ, an. M.j. fiat decoctio ad* ℔j. *in qua dissolve mellis rosati* ℥j. *diamoron.* ℥ß. *fiat gargarisma.* You may also make other gargles, of Pomegranate pills, Balaustie, Sumach, Berberies, red roses being boyled, and dissolving in the strained liquor *Diamoron* and *Dianucum* with a little Alum. For *Galen* writes, that simple ulcers of the mouth are healed with things which dry with moderation; now *Diamoron* and *Dianucum* are such. But others stand in need of strong medicins, with such like. If the palat be seised upon, we must use the more diligence and care; for there is danger, lest being the part is hot and moist, the bone which lyes under which is rare and humide, may be corrupted by the contagion and fall away, and the voice or speech be spoiled. If the ulcer be pocky, omitting the common remedies of ulcers, you must speedily betake your self to the proper antidote of that disease, to wit, quick-silver. Fistulous ulcers often take hold on the Gums, whence the root of the next tooth becomes rotten, and so far that the acrimony of the *Sanies* oft-times makes its self a passage forth on the outside under the chin; which thing puts many into a false conceit of the *scrophule* or Kings evill, and consequently of an uncurable disease. In such a case *Aetius*, and *Celsus* counsell is, to take out the rotten tooth, for so the *Fistula* will be taken away, the Gum pressing and thrusting its self into the place of the tooth which was taken forth; and so the cause nourishing the putrefaction being taken away, (that is, the tooth) the rest of the cure will be more easy. The ulcers of the tongue may be cured by the same remedies by which the rest of the mouth; yet those which breed on the side thereof endure very long, and you must look whether or no there be not some sharp tooth over against it, which will not suffer the ulcer in that place to heal; which if there be, then must you take it away with a file.

The cure.

A gargarism for the *Aphthæ. Lib. 6. meth. Cap.* 10.

Ulcers of the palat must be quickly and carefully dressed. *Aetius Lib. 6. cap. 3. Celsus lib. 6. cap. 13.*

CHAP. XVI. *Of the Ulcers of the Ears.*

ULcers are bred in the auditory passage both by an externall cause, as a stroak, or fall, as also by an internall, as an abscess there generated. They oft-times flow with much matter, not there generated, for such ulcers are usually but small and besides in a spermatick part, but for that the brain doth that way disburden its self.

Their causes.

For the cure, the chief regard must be had of the antecedent cause, which feeds the ulcer, and it must be diverted by purging medicins, Masticatories, and Errhines. This is the form of a Masticatory. ℞. *Mastich.* ℥j. *staphi sagr. & pyreth. an.* ℈j. *cinam. & caryoph. an.* ℥ß. *fiant Masticatoria, utatur mane & vesperi.* But this is the form of an Errhin. ℞ *succi betonic. mercurial. & melissæ, an.* ℥ß. *vini albi* ℥j. *misce & frequenter naribus attrahatur.* For topick medicins we must shun all fatty and oily things, as *Galen* set down *in Method. medendi*, where he finds fault with a certain follower of *Thessalus* who by using *Tetrapharmacum*, made the ulcer in the ear grow each day more filthy, than other, which *Galen* healed with the Trochisces of *Andronius* dissolved in Vinegar, whose composure is as followeth. ℞ *balaust.* ℥ij. *alumin.* ℥j. *atrament. sutor.* ℥ij. *myrrhæ* ℥j. *thur. aristoloch. gallarum, an.* ℥ij. *salis Ammon.* ℥j. *excipiantur omnia mellicrato, & fiant trochisci.*

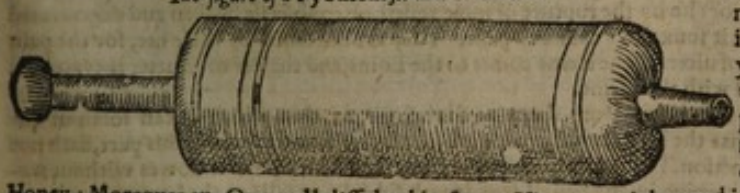
The cure.

A masticatory.

An Errhin.

The composition of *Andronius* his trochisces.

The figure of a Pyoulcus, *or matter-drawer.*



Galen in the same place witnesseth, that he hath healed inveterate ulcers & of two years old of this kind, with the scales of Iron made into powder, and then boiled in sharp Vinegar untill it acquired the consistence of Honey: Moreover an Oxes gall dissolved in strong Vinegar, and dropped in warm, amends and dryes up the putrefaction wherewith these ulcers flow. Also the scales of Iron made into powder boyled in sharp Vinegar, dryed and strewed upon them. But if the straitness of the passages should not give leave to the matter contained in the windings of the ears to passe forth, then must it be drawn out with an Instrument thereupon called a *Pyoulcus*, or matter-drawer, whereof this is the figure.

Scales of Iron.

Of the Pyoulcus *Galen* makes mention 2 *ad Glauconem.*

CHAP. XVII. *Of the ulcers of the windpipe, weazon, stomach and Guts.*

THese parts are ulcerated either by an externall cause, as an acrid medicine, or poyson swallowed down; or by an internall cause, as a malign fretting humor which may equall the force of poyson generated in the body, and restrained in these parts. If the pain be encreased by swallowing or breathing, it is the sign of an ulcer in the weazon, or windpipe joining thereto. But the pain is most sensibly felt when as that which is swallowed is either sour or acrid, or the

The Causes. Signs.

air breathed in, is more hot or cold than ordinary. But if the cause of pain lye fastned in the stomach; more grievous symptomes urge; for sometimes they swound, have a nauseous dispositition and vomiting, convulsions, gnawings, and pain almost intolerable, & the coldness of the extream parts; all which when present at once, few scape unless such as are young, and have very strong bodies. The same affect may befall the whole stomach, but because both for the bitterness of pain, and greatness of danger, that ulcer is far more grievous which takes hold of the mouth of the Ventricle, honoured by the Ancients with the name of the Heart; therefore Physitians do not make so great a reckoning of that which happens in the lower part of the stomach. Now we know that the Guts are ulcerated if *Pus*, or much purulent matter come forth by stool; if blood come that way with much griping; for by the *Pus* staying and as it were gathered together in that place, there is as it were a certain continuall *Tenesmus*, or desire to goe to stool. Now all such ulcers are cured by meats and drinks, rather than by medicins, according to *Galen*. Therefore you must make choice of all such meats and drinks as are gentle, and have a lenitive faculty, shunning acrid things; for *Tutia*, Lytharge, Ceruse, Verdigreece & the like, have no place here, as they have in other ulcers. But when as the ulcer shall be in the Gullet or Weazon, you must have a care that such things may have some viscidity or toughnesse, and be swallowed by little and little, and at divers times; otherwise they will not much avail, because they cannot make any stay, in these commune wayes of breath and meat; therefore they presently slip down and flow away; wherefore all such things shall be used in form of an *Eglegma*, to be taken lying on the back, and swallowed down by little and little, opening the muscles of the throat, lest the medicin passing down suddainly and in great quantity, cause a cough, a thing exceeding hurtfull to these kinds of ulcers. When they must be clensed, you shall have crude honey, which hath a singular faculty, above all other detergent things, in these kind of ulcers. But when they can conveniently swallow, you shall mix Gum Tragacanth dissolved in some astringent decoction. In ulcers of the stomach all acrid things (as I have formerly advised) must be shunned, as those which may cause pain, inflammation and vomit, and besides hinder the digestion of the meat. Therefore let them frequently use a ptisan, and sugred gellyes wherein gum Tragacanth, and bole Armenick have been put, the decoction of Prunes, Dates, Figs, Raisons, Honey, Cowes milk boyled with the yolks of egs, and a little common honey. When they are to be agglutinated, it will be convenient to make use of austere, astringent, and agglutinative things which want all acrimony, and ungratefull taft, such as are *Hypocistis*, Pomegranate flowres and pills, *terra sigillata*, *sumach*, *acacia*, a decoction of quinces, the Lentisk wood, the tops of Vines, of brambles, myrtles, made in astingent wine, unlesse there be feare of inflammation. Their drink shall be *Hydromel* water with Sugar, syrup of Violets and Iujubes. Honey mixed with other medicins is a very fitting remedy for ulcers of the guts and other parts more remote from the stomach; for if you shall use astringent medicins alone of themselves, they will stick to the stomach; neither will they carry their strength any further; but honey mixed with them, besides that it distributes them to the rest of the body, and helps them forwards to the affected parts, also clenses the ulcers themselves. Here also Asses milk may with good success be used in stead of Goats or Cowes milk. The use of a vulnerary potion is also commendable, if so be that it be made of such hearbes and simples, as by a certain tacit familiarity have respect to the parts affected. But the ulcers of the Guts have this difference amongst themselves, that if the greater guts be affected, you may heal them with a Clyster and injections, made also sharp to correct the putrefaction; such as are those which are made of Barly water, or wine with *Ægyptiacum*. But if the small guts be ulcerated, they must be rather healed by potions and other things taken at the mouth, for that (as *Galen* saith) these things which are put up into the body by the Fundament, do not commonly ascend to the small or slender guts, but such as are taken at the mouth cannot come unlesse with the losse of their faculty, so far as the great guts.

Gal. lib. 5. de loc. affect. cap. 5.

Lib. 4. & 5. Method.

The cure.

How to take medicins for ulcers of the throat.

Why acrid things must be shunned in these ulcers.

How powerfull Honey is to cure such kind of ulcers.

Ægyptiacum good for the ulcers of the greater guts *Lib. 5. meth.*

CHAP. XVIII. *Of the Vlcers of the Kidneys and Bladder.*

Causes.

Signes.

ULcers are caused in the Kidneys and Bladder, either by the use of acrid meats, drinks, or medicins, as *Cantharides*; or else by the collection of an acrid humor bred in that place, sent or faln thither; or else by the rupture of some vessell, or an abscesse broken and degenerated into an ulcer, as it sometimes comes to passe. They are discerned by their site, for the pain and heavinesse of ulcers of the Reins comes to the Loins, and the *Pus* or matter is evacuated well and throughly mixed with the Urine.

Hip. Aphor. 81. sect. 4. Aphor. 76. sect. 4. Aphor. 77. sect. 4.

Neither doth the *Pus* which flows from the reins stink so ill, as that which is cast forth of the bladder; the reason is, for that the bladder being a bloodlesse, fleshlesse and membranous part, hath not such power to resist putrefaction. That *Pus* which flowes from the Kidneys never flowes without water; and although by long keeping in an Urinall, it at length subsides or falls to the bottome, and may be seen separated; yet when it is first made, you may see it perfectly mixed with the Urine; but that *Pus* which flowes from the bladder is oft-times made alone without Urine; and usually it comes to passe that the *Pus*, or matter which flowes from the ulcerated Kidneys, hath in it certain caruncles, or as it were haires, according to the rule of *Hippocrates*. Those who in a thick Urine have little caruncles, and as it were hairs come forth together therewith, they come from their Kidneys; but on the contrary those who have certain bran-like scales come from them in a thick Urine, their bladder is scabby or troubled with a scabby ulcer.

The cure.

Why we must shun strong purges.

For the cure; it is expedient that the belly be soluble either by nature or Art, and the use of mollifying Clysters. And it is good to vomit sometimes, so to draw back the humors by whose confluxe into the affected part the ulcer might be fed and made more sordid and filthy. You must beware of strong purgations, lest the humors being moved and too much agitated, the matter fit to nourish the

ulcer

Ulcer may fall down upon the kidnies or bladder. The ensuing potion is very effectuall to mundifie those kind of Ulcers. R. *Hordei integri, M.* ij. *glycyrrhizæ raſ. & contuſ.* ℥ß. *rad. acetoſæ & petroſel. an.* ℥vj. *fiat decoctio ad* ℔j. *in colatura diſſolve mellis diſpum.* ℥ij. Let him take every morning the quantity of four ounces. *Gordonius* exceedingly commends the following Trochiſces. R. *quatuor ſem frig. maj. mundatorum, ſem. papaveris albi, ſem. malvæ, portul. cydon. baccarum myrti, trag. acanth. gum. arab. mucum pinearum mund. piſtach. glycyrrhizæ mund. mucaginis ſem. pſilii, amygd. dulc. hordei mund. an.* ℥ij. *bol. armeni ſang. drac. ſpodii, roſarum, myrrhæ, an.* ℥ß. *excipiantur hydromelite, & fingantur trochiſci ſinguli ponderis* ℥ij. Let him take one thereof in the morning diſſolved in Barley water or Goats milk. *Galen* bids to mixe honey and diuretick things with medicines made for the Ulcers of the reins and bladder, for that they gently move urine, and are as vehicles to carry the medicines to the part affected. Ulcers of the bladder are either in the bottome thereof, or at the neck and urinary paſſage. If they be in the bottome, the pain is almoſt continuall; if in the neck, the pain then pricks and is moſt terrible when they make water and preſently after. The ulcer which is in the bottome ſends forth certain ſcaly or skinny excrements together with the urine; but that which is in the neck, cauſes almoſt a continuall *Tenigo*. Thoſe which are in the bottome are for the moſt part incurable, both by reaſon of the bloodleſs and nervous nature of the part, as alſo for that the ulcer is continually chafed and troubled by the acrimony of the urine, ſo that it can hardly be cicatrized. For even after making of water ſome reliques of the urine alwayes remain in the bottome of the bladder, which could not therefore paſs forth together with the reſt of the urine, for that for the paſſing forth of the urine, the bladder being diſtended before, fals and is complicated in its ſelfe. Ulcers of the bladder are healed with the ſame medicins as thoſe of the reins are; but theſe not only taken by the mouth but alſo injected by the urinary paſſage. Theſe injections may be made of *Gordonius* his Trochiſces formerly preſcribed, being diſſolved in ſome convenient liquor; but becauſe ulcers of the bladder cauſe greater and more ſharpe pain than thoſe of the kidnies, therefore the Chirurgeon muſt be more diligent in uſing Anodynes. For this purpoſe, I have often by experience found, that the oil of henbane made by expreſſion gives certain help. He ſhall do the ſame with Cataplaſms and liniments applyed to the parts about the *Pecten* and all the lower belly and *perinæum*, as alſo by caſting in of Clyſters. If that they ſtink, it will not be amiſſe to make injection of a little *Ægyptiacum* diſſolved in wine, plantain, or roſe water. For I have often uſed this remedy in ſuch a caſe with very proſperous ſucceſs.

Things to cleanſe theſe ulcers.

Trochiſces for the ulcers of the kidnies and bladder. 4. *Method.*

Signs to know what part of the bladder is ulcerated.

Why ulcers in the bottome of the bladder are uncurable.

Ægyptiacum for the ulcers of the bladder.

CHAP. XIX. *Of the Ulcers of the Womb.*

Ulcers are bred in the womb either by the conflux of an acrid, or biting humour, fretting the coats thereof, or by a tumour againſt nature degenerating into an abſceſſe, or by a difficult and hard labour; they are known by pain at the *perinæum*, and the efflux of *Pus* and *Sanies* by the privity. All of them in the opinion of *Avicen* are either putrid, when as the *Sanies* breaking forth is of a ſtinking ſmell, and in colour reſembles the water wherein fleſh hath been waſhed; or elſe ſordid, when as they flow with many virulent and crude humours; or elſe are eating or ſpreading ulcers, when as they caſt forth black *Sanies*, and have pulſation joined with much paine. Beſides they differ amongſt themſelves in ſite, for either they poſſeſs the neck and are known by the ſight, by putting in a *ſpeculum*, or elſe are in the bottome, and are manifeſted by the condition of the more liquid and ſerous excrements, and the ſite of the pain. They are cured with the ſame remedies wherewith the ulcers of the mouth, to wit, with *aqua fortis*, the oil of Vitriol and Antimony, and other things made ſomewhat more milde, and corrected with that moderation, that the ulcerated parts of the Womb may be ſafely touched with them; it is requiſite that the remedies which are applyed to the ulcers of the womb, do in a moment that which is expected of them, for they cannot long adhere or ſtick in the womb, as neither to the mouth. *Galen* ſaith that very drying medicins are exceeding fit for the ulcers of the womb, that ſo the putrefaction may be hindred or reſtrained, whereto this part as being hot and moiſt is very ſubject; beſides that the whole body unto this part as unto a ſink ſends downe its excrements. If an ulcer take hold of the bottome of the womb, it ſhall be cleanſed and the part alſo ſtrengthened by making this following injection. R. *hordei integri* p. ij *guajaci* ℥j. *rad. Ireos.* ℥ß. *abſinth. plant. centaur. utriuſque, an. M.* j. *fiat decoct. in aqua fabrorum ad* ℔ij. *in quibus diſſolve mellis roſati, & ſyrupi de abſinthio, an.* ℥iij. *fiat injectio.* For amending the ſtinking ſmell I have often had certaine experience of this enſuing remedy. R. *vini rub.* ℔j. *unguent. egyptiaci* ℥ij. *bulliant parum.* Thus the putrefaction may be corrected, and the painfull malicioufneſs of the humour abated. Ulcers when they are cleanſed muſt preſently be cicatriced; that may be done with Alum water, the water of Plantain wherein a little Vitriol or Alum have been diſſolved. Laſtly, if remedies nothing availing, the ulcer turn into a *cancer*, it muſt be dreſſed with anodynes and remedies proper for a *cancer*, which you may finde ſet down in the proper treatiſe of *Cancers*. The cure of ulcers of the fundament was to be joined to the cure of theſe of the womb; but I have thought good to referre it to the treatiſe of *Fiſtula's*, as I do the cure of theſe of the urinary paſſage to the treatiſe of the *Lues venerea*.

The cauſes.

Lib. 3. ſect. 12. aralt. 2. cap. 5.

Signes.

The cure

Why ſtrongly drying things are good for ulcers of the womb.

An injection for an ulcer in the bottome of the wombe.

An injection hindring putrefaction.

CHAP. XX. *Of the* Varices *and their cure by cutting.*

A *Varix* is the dilatation of a vein, ſome whiles of one and that a ſimple branch, other whiles of many. Every *varix* is either ſtreight or crooked, and as it were infolded into certaine windings within its ſelfe. Many parts are ſubject to *Varices*, as the temples, the region of the belly under the navill, the teſticles, womb, fundament, but principally the thighs and legs. The matter of them is uſually melancholy bloud, for *Varices* often grow in men of a melancholy temper, and which uſually feed on groſs meats, or ſuch as breed groſs and melancholy humours. Alſo women with child are commonly troubled with them, by reaſon of the heaping together of their ſuppreſſed menſtruall evacuation.

What a *Varix* is, and what be the differences thereof.

The matter.

The causes. Signes. cuation. The precedent causes are a vehement concussion of the body, leaping, running, a painful journey on foot, a fall, the carrying of a heavy burden, torture or racking. This kind of disease gives manifest signs therof by the lageness, thickness, swelling and colour of the veines. It is best not to meddle with such as are inveterate; for of such being cured there is to be feared a reflux of the melancholly bloud to the noble parts, whence there may be imminent danger of malign ulcers, a cancer, madness or suffocation. When as many *Varices* and diversly implicit are in the legs, they often swell with congealed and dryed bloud, and cause pain which is increased by going and compression. Such like *varices* are to be opened by dividing the veine with a Lancet, and then the bloud must be pressed out, and evacuated by pressing it upwards and downwards; which I have oft-times done, and that with happy success to the Patients, whom I have made to rest for some few dayes, and have applyed convenient medicins. A *varix* is often cut in the inside of the leg a little below the knee, in which place commonly the originall thereof is seen. He which goes about to intercept a *varix* downwards from the first originall and as it were fountain thereof, makes the cure far more difficult. For hence it is divided as it were into many rivelets, all which the Chirurgeon is forced to follow.

The cure. The cutting of *Varices*.

For what intention a *Varix* must be cut. *Paulus cap. 82. lib. 6.* The manner how to cut it.

A *varix* is therefore cut or taken away so to intetcept the passage of the blood and humours mixed together therewith, flowing to an ulcer seated beneath; or else lest that by the too great quantity of blood, the vessel should be broken, and death be occasioned by a hæmorrhagie proceeding from thence. Now this is the manner of cutting it. Let the Patient lye upon his back on a bench or table, then make a ligature upon the leg in two places the distance of some four fingers each from other, wherein the excision may be made, for so the vein will swell up and come more in sight, and besides you may also mark it with inke; then taking the skin up between your fingers cut it long wayes according as you have marked it, then free the bared vein from the adjacent bodies, and put thereunder a blunt pointed needle (lest you prick the vein) thred with a long double thred, and so bind it fast; and then let it be opened with a Lancet in the middle under the ligature just as you open a vein, and draw as much therehence as shall be fit. Then straight make a ligature in the lower part of the forementioned vein, and then cut away as much of the said vein as is convenient between the ligatures, and so let the ends thereof withdraw themselves into the flesh above and below; let these ligatures alone untill such time as they fall away of themselves. The operation being performed, let an astringent medicine be applyed to the wound and the neighbouring parts; neither must you stir the wound any more for the space of three dayes. Then do all other things as are fit to be done to other such affects.

CHAP. XXI. *Of Fistula's.*

What a Fistula is. A Fistula is a sinuous, white, narrow, callous, and not seldome unperceivable ulcer. It took its denomination from the similitude of a reeden (Fistula) that is, a pipe, like whose hollowness it is. A Fistula is bred in sundry parts of the body, and commonly followes upon abscesses or ulcers not well cured.

What a Callous is. The differences of Fistula's. A *Callous* is a certain fleshy substance, white, solid, or dense and hard, dry and without pain, generated by heaping up of dryed excrementitious phlegme, or else adust melancholy encompassing the circuit of the ulcer, and substituting it selfe into the place of laudable flesh. The *Sinus* or cavity of a Fistula is sometimes dry, and other while drops with continuall moisture: sometimes the dropping of the matter sodainly ceases, and the orifice thereof is shut up, that so it may deceive both the Chirurgeon and the Patient with a false shew of an absolute cure; for within a while after it will open again and run as formerly it did. Some Fistula's are bred by the corruption of a bone, others of a nerve, others of membranes, and others of other parts of the body. Some run straight in, others and that the greater part, have turnings and windings; some have one, others have more orifices and windings, some are at the joints, others penetrate into some capacity of the body, as into the chest, belly, guts, womb, bladder; some are easily, others difficultly cured, and some wholly uncurable. There are divers signs of Fistula's according to the variety of the parts they possess; for if that which you touch with the end of your probe make resistance, and resound, then you may know that it is come to the bone; and then if the end of the probe slip up and down as on a smooth and polite superficies, it is a sign that the bone is yet sound; but if it stop and stay in any place as in a rough way, then know that the bone is eaten, rough and perished; sometimes the bone lies bare, and then you need not use the probe. Besides also it is a sign that the bone is affected, if there be a purulent efflux of an unctuous or oily matter, not much unlike that marrow wherewith the bone is nourished. For every excrement shewes the condition of the nourishment of the part whence it is sent; in a Fistula which penetrates to a nerve, the Patient is troubled with a pricking paine, especially when you come to search with a probe, especially if the matter which flowes down be more acrid. Oft-times if it be cold, the member is stupified the motion being weakened; besides also the matter which flowes from thence is more subtle, and somewhat like unto that which flowes from the bones, yet not oily nor fat, but sanious and viscous, resembling the condition of the alimentary humour of the nerves. The same usually appears and happens in Fistula's which penetrate to the Tendons and those membrances which involve the muscles. If the Fistula be within the flesh, the matter flowing thence is more thick and plentiful, smooth, white, and equall. If it descend into the veins or arteries, the same happen as in those of the nerves, but that there is no such great pain in searching with your probe, nor no offence or impediment in the use of any member: yet if the matter of the fistulous ulcer be so acrid, as that it corrode the vessels, blood will flow forth; and that more thick if it be from a vein, but more subtle and with some murmuring if from an artery. Old Fistula's and such as have run for many years, if suddainly shut up, cause death, especially in an ancient and weak body.

The signes. The signe that the bone is bare from the condition of the matter which is cast forth. *Aetius tetr. 4 serm. 2 cap. 15.* Old Fistula's if closed prove mortall.

CHAP.

CHAP. XXII. *Of the cure of Fistula's.*

FOr the cure; in the first place it will be expedient to search the Fistula; and that either with a wax size, a probe of lead, gold or silver, to find out the depth and windings or corners thereof. But if the Fistula be hollowed with two or more orifices, and those cuniculous, so that you cannot possibly and certainly search or find them all out with your probe; then must you cast an injection into some one of these holes, and so observe the places where it comes forth, for so you may learn how many, and how deep or superficiary cavities there be; then by making incisions you must lay open and cut away the callous parts. You must make incisions with an incision knife or razour; or else apply actuall or potentiall cauteries; for nature cannot unlesse the callous substance be first taken away, restore or generate flesh or agglutinate the distant bodies. For hard things cannot grow together, unlesse by the interposition of glue, such as is laudable blood; but a callous body on all sides possessing the surface of the ulcerated flesh, hinders the flowing of the blood out of the capillary veins for the restoring of the lost substance and uniting of the disjoined parts. If you at any time make caustick injections into the Fistula, you must presently stop the orifice thereof, that so they may have time to worke the effect, for which they are intended. Which thing we may conjecture by the tumor of the part, the digesture of the flowing matter, and its lesser quantity. Then you must hasten the falling away of the Eschar, and then the ulcer must be dressed like other ulcers. But oft-times the *Callus* which possesses the sinuous cavity of a Fistula, overcome by the power of acrid and escarcotick medicins comes whole forth, and falls out like a pipe, and so leaves a pure ulcer underneath it. Which I observed in a certain Gentleman, when I had washed with strong *Ægyptiacum* divers times a Fistulous ulcer in his thigh shot through with a bullet; then presently by putting in my Balsam formerly described, he grew well in a short time. Fistula's which are neer great vessells, Nerves or principall intrailes, must not be medled with unless with great caution. When a Fistula proceeds by the fault of a corrupt bone, it is to be considered whether that fault in your bone be superficiary, or deeper in, or whether it is wholly rotten and perished. For if the default be superficiary it may easily be taken away with a desquammatory Trepan; but if it penetrate even to the marrow, it must be taken forth with cutting mullets, first having made way with a *Terebellum*. But if the bone be quite rotten and perished, it must be wholly taken away, which may be fitly done, in the joints of the fingers, the *radius* of the Cubit and Leg; but no such thing may be attempted in the socket of the Huckle bone, the head of the Thigh bone, or any of the Rack bones when they are mortified, neither in those Fistula's, which are of their own nature uncurable; but you shall think you have discharged your duty and done sufficiently for the Patient, if you leave it with a prognostick. Of this nature are Fistula's which penetrate even to the bowells, which come into the parts orespread with large vessells or Nerves, which happen to effeminate and tender persons, who had rathrr dye by much, then to suffer the pain and torment of the operation. Like caution must be used, when by the cutting of a Fistula there is fear of greater danger, as of convulsion if the disease be in a nervous part. In these and the like cases the Chirurgeon shall not set upon the perfect cure of the disease, but shall think it better to prevent by all means possible that the disease by fresh supplies become no worse, which may be done if he prevent the falling down of any new defluxion into the part; if by an artificiall diet he have a care that excrementitious humors be not too plentifully generated in the body; or so order it, that being generated they may be evacuated at certain times, or else diverted from the more noble to the base parts. But in the mean space it shall be requisite to wast the faulty flesh, which growes up more then is fitting in the ulcer, and to clense the *sordes* or filth, with medicins, which may do it without biting or acrimony and putrefaction.

How to find out the windings and cavities of Fistula's.

Caustick injections.

Celsus lib. 5.

Remedies for a Fistula proceeding from a corrupt bone.

The cure of what Fistula's may be attempted, and which may not.

A palliative cure of a Fistula.

CHAP. XXIII. *Of the Fistula's in the Fundament.*

THe Fistula's in the Fundament are bred of the same causes as other kinds of Fistula's are; to wit, of a wound or abscesse not well cured, or of a hæmorrhoid which is suppurated. Such as are occult, may be known by dropping down of the *sanious* and purulent humor by the Fundiment and the pain of the adjacent parts. But such as are manifest by the help of your probe you may find whither they goe and how far they reach. For this purpose the Chirurgeon shall put his finger into the Fundament of the Patient, and then put a Leaden probe into the orifice of the Fistula, which if it come to the finger without interposition of any *medium*, it is a sign it penetrates into the capacity of the Gut. Besides also then there flowes not only by the Fundament but also by the orifice which the malign humor hath opened by its acrimony, much matter, somewhiles sanious, and oft-times also breeding Worms. Fistula's may be judged cuniculous, and running into many turnings and windings, if the probe do not enter far in, and yet notwithstanding more matter flowes therehence then reason requires should proceed from so small an ulcer. You may in the orifices of all Fistula's, perceive a certain callous wart, which the common Chirurgeons teame a Hens arse. Many symptomes accompany Fistula's which are in the Fundament, as a *Tenesmus*, strangury and falling down of the Fundament. If the Fistula must be cured by manuall operation, let the Patient lye so upon his back, that lifting up his legs, his thighs may presse his belly, then let the Chirurgeon, having his nail pared, put his finger beimeared with some ointment into the Patients Fundament; then let him thrust in at the orifice of the Fistula a thick Leaden needle drawing after it a thread consisting of thread and horse hairs woven together, and then with his finger taking hold thereof and somewhat crooking it, draw it forth at the Fundament, together with the end of the Thread. Then let him knit the two ends of the thread with a draw or loose knot, that so he may straiten them at his pleasure.

The causes.

Signs.

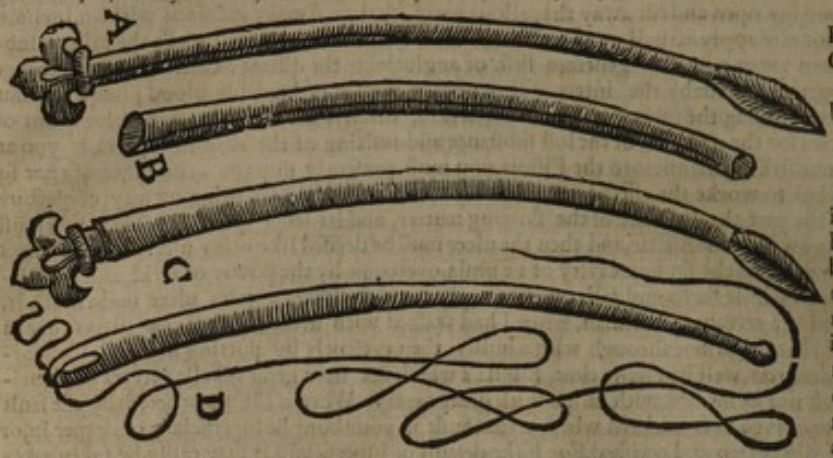
Symptomes.

The art of binding and cutting a Fistula of the Fundament.

But

But before you bind them you ſhall draw the thread ſomewhat roughly towards you as though you meant to ſaw the fleſh therein contained, that you may by this means cut the Fiſtula without any fear of an Hæmorrhage, or flux of blood. It ſometimes happens that ſuch Fiſtula's penetrate not into the Gut; ſo that the finger by interpoſition of ſome callous body cannot meet with the needle or probe. Then it is convenient to put in a hollow Iron or ſilver probe ſo through the cavity thereof to thruſt a ſharp pointed needle, & that by pricking and cutting may deſtroy the *Callus*; which thing you cannot perform with the formerly deſcribed leaden probe, which hath a blunt point, unleſs with great pain.

The deſcription of a hollow ſilver Probe to be uſed with a needle, as alſo a Leaden Probe.



A. *Shewes the Needle.*
B. *The hollow probe.*
C. *The needle with the probe.*
D. *The Leaden needle drawing a thread after it.*

The *Callus* being waſted, the Fiſtula ſhall be bound as we formerly mentioned. That which is ſuperficiary needs no binding, onely it muſt be cut with a crooked *ſcalprum*, and the *Callus* being conſumed, the reſt of the cure muſt be performed after the manner of other ulcers. But you muſt note, that if any parcell of the Callous body remain untoucht by the medicin or Inſtrument, the Fiſtula reviving again will cauſe a relapſe.

CHAP. XXIIII. *Of Hæmorrhoides.*

What they are.

HÆmorrhoides, as the word is uſually taken, are tumors at the extreamities of the veins encompaſſing the Fundament, cauſed by the defluxion of an humor commonly mælancholick, and repreſenting a certain kind of *Varices*. Some of theſe run at an hole being opened, which ſometimes in ſpace of time contracts a *Callus*; others only ſwell, and caſt forth no moiſture; ſome are manifeſt; other lye only hid within. Thoſe which run, commonly caſt forth blood mixed with yellowiſh ſerous moiſture, which ſtimulates the blood to break forth, and by its acrimony opens the mouths of the veins. But ſuch as do not run, are either like bliſters, ſuch as happen in burns, and by practitioners are uſually called *veſicales*, and are cauſed by the defluxion of a phlegmatick and ſerous humor; or elſe repreſent a Grape, whence they are called *Vvales*, generated by the afflux of blood laudable in quality, but overabundant in quantity; or elſe they expreſſe the manner of a diſeaſe, whence they are termed *morales*, proceeding from the ſuppreſſion of melancholick blood; or elſe they repreſent warts, whence they are ſtiled *Verrucales*, enjoying the ſame materiall cauſe of the generation as the *morales* do. This affect is cauſe of many accidents in men; for the perpetuall efflux of blood extinguiſheth the vivid and lively colour of the face, calls on a dropſie, overthrows the ſtrength of the whole body. The flux of Hæmorrhoides is commonly every moneth, ſometimes only foure times in a yeare. Great pain, inflammation, an Abſceſſe which may at length end in a Fiſtula, unleſſe it be reſiſted by convenient remedies, do oft-times forerun the evacuation of the Hæmorrhoides. But if the Hæmorrhoides flow in a moderate quantity, if the Patients brook it well, they ought not to be ſtayed, for that they free the Patients from the fear of iminent evills, as melancholy, leproſie, ſtrangury and the like. Beſides, if they be ſtopped without a cauſe, they by their reflux into the Lungs cauſe their inflammation, or elſe break the veſſells thereof, and by flowing to the Liver cauſe a dropſie by the ſuffocation of the native heat; they cauſe a dropſie, and univerſall leanneſſe on the contrary, if they flow immoderately, by refrigerating the Liver by loſſe of too much blood; wherefore when as they flow too immoderately, they muſt be ſtayed with a pledget of hares down dipped in the enſuing medicin. R *pul. aloes, thuris, balauſt. ſang. draconis, an.* ℥ß. *incorporentur ſimul cum ovi albumine, fiat medicamentum ad uſum.* When they are ſtretched out and ſwoln without bleeding, it is convenient to beat an Onion roaſted in the embers with an Oxes gall; and apply this medicin to the ſwoln places, and renew it every five houres. This kind of remedy is very prevalent for internall Hæmorrhoides; but ſuch as are manifeſt may be opened with horſleaches, or a Lancet. The juice or maſſe of the hearb called commonly Dead-nettle or Ark-angell, applyed to the ſwoln Hæmorrhoides opens them, and makes the congealed blood flow therehence. The *Fungus* and *Thymus* being diſeaſes about the fundament are cured by the ſame remedy. If acrimony, heat and pain do too cruelly afflict the Patient, you muſt make him enter into a bath, and preſently after apply to the ulcers (if any ſuch be) this following remedy. R *Olei roſ.* ℥iiij. *ceruſæ* ℥i. *Litharg.* ℥ß. *ceræ novæ,* ℥vj. *opii* ℈j. *fiat unguent. ſecundum artem.* Or elſe, R *thuris, myrrhæ, croci, an.* ʒj. *opii* ℈j. *fiat unguentum cum oleo roſarum & mucagine ſem. pſillii, addendo vitellum unius ovi.* You may eaſily proſecute the reſidue of the cure according to the generall rules of Art.

Their differences.

Symptomes.

Sent. 37 ſect. 6 epid.

A remedy for the immoderate flowing of the Hæmorrhoides.

For ſuppreſt Hæmorrhoides

The end of the Thirteenth Booke.

Of

OF BANDAGES, OR, LIGATVRES.

THE FOURTEENTH. BOOK.

CHAP. I. *Of the differences of Bandages.*

BAndages, wherewith we use to bind, do much differ amongst themselves. But their differences (in *Galens* opinion) are chiefly drawn from six things; to wit, their matter, figure, length, breadth, making, and parts whereof they consist. Now the matter of Bandages is threefold; Membranous or of skins, which is accommodated peculiarly to the fractured grisles of the Nose; of Woollen, proper to inflamed parts, as those which have need of no astriction; of Linnen, as when any thing is to be fast bound: and of Linnen cloaths, some are made of flax, othersome of hemp, as *Hippocrates* observes. But Bandages do thus differ amongst themselves in structure, for that some thereof consist of that matter which is sufficiently close and strong of it self, such are the membranous; others are woven, as the linnen ones. But that linnen is to be made choice of for this use, and judged the best, not which is new and never formerly used, but that which hath already been worn and served for other uses, that so the Bandages made thereof may be the more soft and pliable: yet must they be of such strength, that they may not break with stretching, & that they may straitly contain & repell the humor ready to flow down, and so hinder it from entring the part. These, besides, must not be hemmed nor stitched, must have no lace nor seam; for hems and seams by their hardness presse into, and hurt the flesh that lyes under them. Lace, whether in the midst or edges of the rowler, makes the Ligature unequall. For the Member where it is touched with the lace, as that which will not yeeld, is pressed more hard; but with the cloth in the middle more gently, as that which is more lax. Furthermore, these Ligatures must be of clean cloth, that if occasion be, they may be moistened or steeped in liquor appropriate to the disease, and that they may not corrupt, or make worse that liquor by their moistening therein. Now the Bandages which are made of Linnen clothes must be cut long-wayes, and not athwart, for so they shall keep more firm and strong that which they bind, and besides, they will be alwaies alike, and not broader in one place then in another. But they thus differ in figure, for that some of them are rowled up, to which nothing must be sowed, for that they ought to be of a due length to bind up the member: others are cut or divided, which truely consist of one piece, but that divided in the end (such are usually taken to bind up the breasts) or else in the midst; others are sowed together, which consist of many branches sowed together, and ending in divers heads, and representing divers figures, such are the Bandages appropriated to the head. But they thus differ in length, for that some of them are shorter, others longer: so in like sort for breadth; for some are broader, others narrower. Yet we cannot certainly define nor set down neither the length, nor breadth of Rowlers, for that they must be various, according to the different length and thickness of the members or parts. Generally they ought both in length and breadth to fit the parts, whereunto they are used. For these parts require a binding different each from other, the head, the neck, shoulders, arms, breasts, groins, testicles, fundament, hips, thighs, legs, feet and toes. For the parts of Bandages, we tearm one part their body, another their heads. By the body we mean their due length and breadth; but their ends, whether they run long-wayes or a-crosse, we according to *Galen*, term them their heads.

Lib. de fasciis.

Sect. 3. de Chir. offic.

What cloth best for rowlers.

Com. ad sect. 22 sect. 2. de offic. chir.

CHAP. II. *Sheweth the indications and generall precepts of fitting of Bandages and Ligatures.*

THere are, in *Hippocrates* opinion, two indications of fitting Bandages or Ligatures; the one whereof is taken from the part affected; the other from the affect it self. From the part affected: so the leg, if you at any time bind it up, must be bound long-wayes, for if you bind it overthwart, the binding will loosen as soon as the Patient begins to go, and put forth his leg, for then the muscles take upon them another figure. On the contrary the Arm or Elbow must be bound up, bending in and turned to the breast, for otherwise at the first bending, if it be bound when it is stretched forth, the Ligature will be slacked, for that (as we formerly said) the figure of the muscles is perverted. Now for this indication, let each one perswade himself thus much, that the part must be bound up in that figure, wherein we would have it remain.

1. & 2. sect. lib. de fract.

Now for that indication which is drawn from the disease, if there be a hollow ulcer, sinuous and cuniculous, casting forth great store of *Sanies*, then must you begin the ligature and binding from the bottom of the *sinus*, and end at the orifice of the ulcer; and this precept must you alwayes observe, whether the *sinus* be sealed in the top, bottom, middle, or sides of the ulcer. For thus the filth therein contained shall be emptied and cast forth, and the lips of the ulcer too far separated, shall be joined together; otherwise the contained filth will eat into all that lyes neer it, increase the ulcer, and make it

We must alwaies begin our ligatures at the bottom of a *sinus*.

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uncurable by rotting the bones which lye under it with this acrid *ſanies* or filth. But ſome Ligatures are remedies of themſelves, as thoſe which perform their duties of themſelves, and whereto the cure is committed, as are theſe which reſtore their native unitie, thoſe parts which are disjoined: others are not uſed for their own ſakes, but only to ſerve to hold faſt ſuch medicins as have a curative facultie. This kind of Ligature is either yet a doing, and is termed by *Hippocrates Deligatio operans*; or elſe done and finiſhed, and is called, *Deligatio operata*: for the firſt, that the Ligature may be well made, it is fit that it be cloſe rowled together, and beſides, that the Surgeon hold it ſtiffe and ſtrait in his hand, and not careleſly, for ſo he ſhall bind up the member the better. Alſo he muſt in the binding obſerve, that the ends of the Rowler, and conſequently their faſtning may not fall to be on the affected or grieved part, for it is better that they come above or below, or elſe on the ſide: beſides alſo, he muſt have a ſpeciall care that there be no knot tyed upon the ſame place, or upon the region of the back, buttocks, ſides, joints, or back part of the head, or to conclude in any other part upon which the Patient uſes to lean, reſt or lye. Alſo on that part where we intend to ſow or faſten the Rowlers, you muſt double in their ends, that ſo the faſtning or ſuture may be the ſtronger, otherwiſe how cloſe ſoever they ſhall be wrapped or rowled about the member, yet will they not remain firm, eſpecially if they be of a great breadth. For the ſecond kind of Ligature, to wit, that which is already done and finiſhed; the Surgeon, the performer thereof, muſt conſider to what end it was done, and whether he hath performed it well and fitly, as alſo neatly and elegantly, to the ſatisfaction both of himſelf and the beholders. For it is the part of a skilfull Workman every where handſomely and rightly to perform that which may ſo be done.

Hip. cent. 4. Sect 2. offic. Initio 2 ſect. off.

Ligatures muſt not be only lightly, but alſo neatly performed.

In fractures and luxations and all diſlocations of bones, as alſo in wounds and contuſions, you muſt begin your bandage with two or three windings or wraps about upon the place, and that (if you can) more ſtraitly than in other places, that ſo the ſet bones may be the better kept in their places, and that the humors, if any be already fallen thither, may by this ſtrait compreſſion be preſſed forth, as alſo to hinder and prevent the entrance in of any other which may be ready to fall down. But in fractures (as thoſe which never happen without contuſion) the blood flowes, and is preſſed forth of its proper veſſels, as thoſe which are violently battered and torn, which cauſes ſugillation in the neighbouring fleſh, which firſt looks red, but afterwards black and blue by reaſon of the corruption of the blood poured forth under the skin. Wherefore after theſe firſt windings, which I formerly mentioned, you muſt continue your rowling a great way from the broken or luxated part; he which does otherwiſe, will more and more draw the blood and humors into the affected part, and cauſe Impoſtumes, and other malign accidents. Now the blood which flowes, goes but one way downwards, but that which is preſſed is carryed as it were in two paths, to wit, from above do wnwards, and from below upwards. Yet you muſt have a care that you rather drive it back into the body and bowels, then towards the extremities thereof, as being parts which are uncapable of ſo much matter, and not furniſhed with ſufficient ſtrength to ſuffer that burden, which threatens to fall upon it, without danger and the increaſe of prenaturall accidents. But when this maſſe and burden of humors is thruſt back into the body, it is then ruled and kept from doing harm by the ſtrength and benefit of the faculties remaining in the bowels and the native heat.

Gal. com. ad ſent. 25. ſect 1. lib. de fract.

CHAP. III. *Of the three kinds of Bandages neceſſary in fractures.*

TWo ſorts of Ligatures are principally neceſſary for the Surgeon, according to *Hippocrates*, by which the bones aſwell broken as diſlocated may be held firm when they are reſtored to their naturall place.

Sect. 24. ſect. 2. offic.

Of theſe ſome are called *Hypodeſmides*, that is, Under-binders: others, *Epideſmi*, that is, Over-binders. There are ſometimes but two under-binders uſed, but more commonly three. The firſt muſt firſt of all be caſt over the fracture, and wrapped there ſome three or foure times about, then the Surgeon muſt mark and obſerve the figure of the fracture; for as that ſhall be, ſo muſt he vary the manner of his binding. For the Ligature muſt be drawn ſtrait upon the ſide oppoſite to that whereto the luxation or fracture moſt inclines, that ſo the bone which ſtands forth may be forced into its ſeat, and ſo forced may be the more firmly there contained. Therefore if the right ſide be the more prominent or ſtanding forth, thence muſt you begin your ligation, and ſo draw your ligature to the left ſide. On the contrary, if the left ſide be more prominent, beginning there, you ſhall goe towards the oppoſite ſide in binding and rowling it. Here therefore would I require a Surgeon to be *Ambidexter*, (i.) having both his hands at command, that ſo he may the more exquiſitely perform ſuch variety of ligations. But let him in rowling, bend or move this firſt ligature upwards, that is, towards the body, for the former reaſons. But neither is this manner of ligation peculiar to fractures, but common to them with luxations: for, into what part ſoever the luxated bone flew, then when it is reſtored, that ſide muſt be bound the more looſly and gently whence it departed, and that on the contrary more hard unto which it went. Therefore the ligature muſt be drawn from the ſide whereunto the bone went; ſo that on this ſide it be more looſe and ſoft, and not ſtraitly preſſed with boulſters or rowlers, that ſo it may be more inclined to the ſide oppoſite to the luxation. If the ligation be otherwiſe performed, it ſucceeds not well, for the part is relaxed, and moved out of its natural ſeat: wherefore there will be no ſmall danger, leſt the bone be forced out again, and removed from its place, whereinto it was reſtored by art and the hand. Which thing *Hippocrates* ſo much feared, that on the contrary he willed that the ſet bone ſhould be drawn ſomewhat more unto the part contrary to that whereunto it was driven by force, than the naturall and proper ſite thereof ſhould require. But to return to our former diſcourſe of the three Ligatures: The firſt underbinder being put on, we then take the ſecond, with which we in like ſort begin at the fracture, but having wrapped it once or twice about

Hypodeſmides.

bout there, for that, as we formerly said, we must not force back, and presse so much blood towards the extremities, as we must do towards the body and bowels. Wherefore this *Ligature* shall be drawn from above downwards, gently straining it to presse forth the blood contained in the wounded part: When by rowling you shall come to the end of the part, then you shall carry back again that which remains thereof, to wit, upwards; But otherwise you may take the third under-binder, wherewith you may begin to rowle, whereas you left with the second, & you may carry it thus, rowling it from below upwards. These under-bindings thus finished, apply your boulsters, after them your over or upper-bindings, which are oft-times two, but sometimes three. The first hath two heads, and is wrapped both from the right hand and the left, for the preservation of the first under-binder and the boulsters, and restoring the muscles to their native figure. The two other which remain, consist of one head, and the one of them must be rowled from below upwards, the other from above downwards, after such a manner, that they may be directly contrary to the under-binders; as if they were rowled from the right hand, then these must be from the left. Now this is the manner of *Hippocrates* his Ligation, which, for that it is now grown out of use, we must here set down that which is in common use. They do not at this time use any over-binders, but that which we termed the third under-binder serves our Surgeons in stead of the three forementioned over-binders. Wherefore they carry this third under-binder, wrapped from below upwards (as we formerly said) contrary to the first and second under-binder; as if these begun on the right side, this shall be rowled from the left, and shall end whereas the first under-binder ended. And you must not only draw it indifferently hard, but also make the spires and windings more rare. This third rowler is of this use in this manner of Ligation, that is, it restores the muscles to their native figure, from whence they were somewhat altered by the drawing and rowling of the two former Ligatures. But you must always have regard, that you observe that measure in wrapping your Ligatures, which reason, with the sense of the Patient, and ease in suffering, prescribes; having regard that the tumor become not inflamed. Also the habit of the body ought to prescribe a measure in Ligation: for tender bodies cannot away with so hard binding as hard. Verily, in fractures and luxations, the humors by too strait binding are pressed into the extreme parts of the body; whence grievous and oft-times enormous Oedema's proceed; for healing whereof the Ligature must be loosed, and then the tumified parts pressed by a new rowling, which must be performed from below upwards, and so, by forcing the matter of the tumor thither, it may be helped; for there is no other hope or way to drive the humor back again. He which doth this, forsakes the proper cure of the disease, so to resist the symptome, which the Surgeon shall never refuse to do, as often as any necessary cause shall require it. For this cause *Hippocrates* bids, that the bandages be loosed every three dayes, and then to foment the part with hot water, that so the humors, which (drawne thither by the vehemency of pain) have setled in the part, may be dissolved and dispersed; and itching and other such like symptomes prevented. The fear of all accidents being past, let the Ligation be sooner or later loosed, and more slacked then it formerly was accustomed; that so the blood and laudable matter, whereof a *Callus* may ensue, may flow more freely to the affected part.

When the third under-binder is necessary. *Epidesmi.*

The manner of binding now in use.

What mean to be observed in wrapping the Ligatures.

VVhy *Hippoc.* bids to loose the Ligatures every third day.

CHAP. IIII. *Of the binding up of Fractures associated with a wound.*

IT sometimes happens, that a Fracture is associated by a wound, and yet for all this it is fit to bind the part with a Ligature, otherwise there will be no small danger of swelling, inflammation, and other ill accidents, by reason of the too plentifull afflux of humors from the neigbouring parts. But it is not fit to endeavour to use that kind of binding which is performed with many circumvolutions or wrappings about. For seeing the wound must be dressed every day, the part must each day necessarily be stirred, and the Ligature, consisting of so many windings, loosed; which thing will cause pain, and consequently hinder the knitting and uniting which is performed by rest. Therefore this kind of binding may be performed by one only rowling about the wound, and that with a rowler which consists of a twice or thrice doubled cloth, made in manner of a boulster, and sewed with as much convenience as you can, that it may be so large as to encompasse and cover all the wound, for these reasons, which shall be delivered at large in our Treatise of Fractures. But if the wound run long-wayes, let the boulsters and splints be applyed to the sides of the wound, that so the lips of the wound may be pressed together, and the contained filth pressed forth. But if it be made overthwart, we must abstain from boulsters and splints: for that, in *Galens* opinion, they would dilate the wound, and the purulent matter would be pressed out, and cast back into the wound.

How to bind up a Fracture with a wound.

Ad sent. 12. sect. de fract.

CHAP. V. *Certain common precepts of the binding up of Fractures and and luxations.*

IN every Fracture and Luxation, the depressed, hollow and extenuated parts, such as are neer unto the joints, ought to be filled up with boulsters, or clothes put about them, so to make the part equall, that so they may be equally and on every side pressed by the splints, and the bones more firmly contained in their seats. So when the knee is bound up, you must fill the ham or that cavity which is there, that so the ligation may be the better and speedilier performed. The same must be done under the arm-pits, above the heel, in the arm neer the wrist; and, to conclude, in all other parts which have a conspicuous inequality by reason of some manifest cavitie. When you have finished your binding, then enquire of the Patient, whether the member seem not to be bound too strait. For if he say, that he is unable to endure it so hard bound, then must the binding be somewhat slackned. For, too strait binding causes pain, heat, defluxion, a gangrene, and lastly, a sphacell or mortification: but too loose is unprofitable, for that it doth not contain the parts in that state we desire. It is a sign of a just ligation that is neither too strait nor too loose, if the ensuing day the part be swoln with an œdematous tumor, caused

Hipp. sent. 37. & 38. sect. 1. de fract.

The signs of too strait and loose binding up.

caused by the blood pressed forth of the broken place; but of too strait ligation, if the part be hard swoln; and of too loose, if it be no whit swoln as that which hath pressed no blood out of the affected part. Now if a hard tumor, caused by too strait binding, trouble the Patient, it must presently be loosed, for fear of more grievous symptomes, and the part must be fomented with warme *Hydrelæum*, and another indifferent, yea verily, more loose ligature must be made in stead thereof, as long as the pain and inflammation shall continue; in which time and for which cause, you shall lay nothing upon the part which is any thing burdensome. When the patient begins to recover, for three or four dayes space, especially if you find him of a more compact habit and a strong man, the ligature must be kept firm and not loosed. If on the third day, and so untill the seventh, the spires or windings be found more loose, and the part affected more slender; then we must judge it to be for the better. For hence you may gather, that there is an expression and digestion of the humors, causing the tumor made by force of the ligation. Verily, broken bones fitly bound up, are better set, and more firmly agglutinated, which is the cause, why in the place of the fracture the ligation must be made the straiter, in other places more loosly. If the fractured bone stand forth in any part, it must there be more straitly pressed with boulsters and splints. To conclud, the seventh day being past, we must bind the part more straitly then before: for thai then inflammation, pain and the like accidents, are not to be feared. But these things which we have hitherto spoken of the three kinds of Ligatures, cannot take place in each fractured part of the body, as in the chaps, collar-bones, head, nose, ribs. For, seeing such parts are not round and long, a Ligature cannot be wrapped about them, as it may on the arms, thighs, and legs, but only be put on their outsides.

VVhy we must make more strait ligation on the broken part.

CHAP. VI. *The uses for whibh Ligatures serve.*

The first benefit of Ligatures.

BY that which we have formerly delivered, you may understand that Ligatures are of use to restore those things which are separated and moved forth of their places, and join together those which gape; as in fractures, wounds, contusions, sinewous ulcers, and otherlike affects against nature, in which the solution of continuity stands in need of the help of Bandages, for the reparation thereof. Besides also, by the help of Bandages these things are kept asunder or separated, which otherwise would grow together against nature; as in Burns, wherein the fingers and the hams would mutually grow together; as also the Arm-pits to the Chest, the Chin to the Breast, unlesse they be hindred by due ligation. Bandages do also conduce to refresh emaciated parts: wherefore if the right leg wast for want of nourishment, the left leg, beginning at the foot, may be conveniently rowled up even to the groin. If the right arm consume, bind the left with a strait Ligature, beginning at the hand, and ending at the arm-pit. For thus a great portion of blood from the bound-up part is sent back into the *vena cava*, from whence it regurgitates into the almost empty vessels of the emaciated part. But I would have the sound part to be so bound, that thereby it become not painfull; for a dolorifick ligation causes a greater attractation of blood and spirits, as also exercise: wherefore I would have it during that time to be at rest, and keep holy-day. Ligatures also conduce to the stopping of bleedings: which you may perceive by this, that when you open a vein with your lancet, the blood is presently stayed, laying on a boulster and making a Ligature. Also Ligatures, are usefull for women presently after their delivery; for their womb being bound about with Ligatures, the blood wherewith their womb was too much moistened, is expelled, the strength of the expulsive faculty being by this means stirred up to the expulsion thereof: and it also hinders the empty womb from being swoln up with wind, which otherwise would presently enter thereinto. This same Ligature is a help to such as are with child, for the more easie carrying of their burden; especially those whose Child lyes so far down-wards, that lying as it were in the den of the hips, it hangs between the thighs, and so hinders the free going of the mother. Therefore the woman with child is not only eased by this binding of her womb with this Ligature, which is commonly termed, the navill Ligature; but also, her child being held up higher in her womb, she hath freer and more liberty to walk. Ligatures are in like sort good for revulsion and derivation: as also for holding of medicins which are laid to a part, as the neck, breast or belly. Lastly, there is a triple use of Ligatures in amputation of members, as arms and legs. The first to draw and hold upwards the skin and muscles lying under it, that the operation being performed, they may, by their falling down again, cover the ends of the cut-off bones; and so by that means help forwards the agglutination and cicatrization; and when it is healed up, cause the lame member to move more freely, and with lesse pain; and also to performe the former actions, this, as it were, cushion or boulster of musculous flesh lying thereunder. The second is, they hinder the bleeding by pressing together the veins and arteries. The third is, they by strait binding intercept the free passage of the animall spirits, and so deprive the part which lyes thereunder of the sense of feeling, by making it, as it were, stupid or num.

The second.

The third.

The fourth.

The fifth.

The sixth.

The seventh

The eighth, the particular use of ligatures in the amputation of members.

CHAP. VII *Of Boulsters or Compresses.*

The first use of Boulsters

BOulsters have a double use; the first is to fill up the cavities and those parts which are not of an equall thickness to their end. We have examples of cavities in the Arm-pits, Clavicles, Hams and Groins; and of parts which grow small towards their ends, in the arms towards the wrests, in the legs towards the feet, in the thighs towards the knees. Therefore you must fill these parts with boulsters & linnen cloths, that so they may be al of one bigness to their ends.

The second use of them.

The second use of boulsters, is to defend and preserve the first two or three Rowlers or Under-binders, the which we said before must be applyed immediately to the fractured part. Boulsters, according to this twofold use, differ amongst themselves, for that when they are used in the first mentioned kind, they must be applyed athwart; but when in the latter, long-wayes or down-right.

The third use of them.

You may also use Boulsters, lest the too strait binding of the Ligatures cause pain and trouble to the

new

new set bones. A three or four times doubled cloth will serve for the thickness of your Boulsters, but the length and breadth must be more or less, according to the condition of the parts and disease for which they must be applyed.

CHAP. VIII. *Of the use of Splints, Junks, and Cases.*

HAving delivered the uses of Ligatures and Boulsters, it remains that we say somewhat of the other things, which serve to hold the bones in their places; as Splints, Junks, Cases, and such other like. Splints are made and composed of past-bord, of thin splinters of wood, of leather, such as shoo-soals are made with; of the rinds of trees, or plates of latin, or lead, and such other like, which have a gentle and yeelding stifness; yet would I have them made as light as may be, lest they by their weight become troublesome to the affected part. But for their length, breadth, and number, let them be fitted agreeable to the part whereto they must be used. Let also their figure be streight or crooked according to the condition of the member whereto they must be applyed. You must have a speciall care, that they run not so far as the swellings out, or eminencies of the bones; as the ancles, knees, elbows, and the like, lest they hurt them by their pressure: also you must have a care, that they be smaller at their ends, and thicker in their middles, whereas they lye upon the broken bone. The use of splints is, to hold fast and firm, that they may stir no way the broken and luxated bones, after they be set and restored to their places. That they performe this use, it is fit there be no thick boulsters under them, nor over many rowlers; for so through so thick a space, they would not so straitly presse the part. Junks are made of sticks the bigness of ones finger, wrapped about with rushes, and then with linnen cloth: they are principally used in fractures of the thighs and legs. Cases are made of plates of latin, or else of some light wood; their use is, to contain the bones in their due figure, when the Patient is to be carried out of one bed or chamber into another, or else hath need to go to stool: lastly, if we must rest somewhat more strongly upon the broken or luxated members, these Cases will hinder the bones from stirring or flying out on the right side or left, above or below, we sleeping or waking, being willing or unwilling; and in like sort lest being not as yet well knit, or more loosly bound up for fear of pain, inflammation, or a gangrene, they hang downe, fall, or fly in sunder by reason of the inequalities of the bed. Such Cases, Junks, and the like, which serve for restoring and fast holding of broken and luxated bones, we may, according to *Hippocrates* his mind, call them in generall *Glossocomia*. All which things, the young Surgeon, which is not as yet exercised in the works of Art, can scarce tell what they are. But in the mean time, whilest that he may come to be exercised therein, or see others perform these operations, I, as plainly as possibly I could, have in words given him their portraiture or shape.

The matter of Splints.

Their use.

What Junks are.

The matter and use of Cases.

Glossocomium, a generall name for such things.

The end of the Fourteenth Booke.

OF FRACTVRES.

THE FIFTEENTH BOOK.

CHAP. I. *What a Fracture is, and what the differences thereof are.*

A Fracture, in *Galens* opinion, is the solution of continuity in a bone, which by the Greeks is called *Catagma*. There are many sorts of hurting or offending the bones: as the drawing them asunder, luxation, or putting them out of joint; their unnaturall growing together, their cutting or dividing asunder; contusion, abscesse, putrefaction, rottennesse, laying bare the *periosteum* being violated or lost; and lastly, that whereof we now treat, a Fracture. Again, the varieties of Fractures are almost infinite. For one is complete and perfect, another imperfect; one runs long-wise, another transverse, another oblique; one while it is broken into great pieces, another while into little and small scales, which have either a blunt, or else a sharp end, and prick the adjacent bodies of the muscles, nerves, veins or arteries. It sometimes happens, that the bone is not broken into splinters, that is, long-wayes, but together, and at once into two peeces overthwart, which Fracture is called *Raphaneden*, that is, after the manner of a Radish.

Lib. 5. method.

What it is for a bone to be broken *Raphaneden*.

A Fracture is made *Caryédon*, or like a nut, when as the bone flyes into many finall peeces, severed each from other, as when a Nut is broken with a hammer, or mallet upon an Anvile: Which fracture is also termed *Alphitidon*, by reason of the resemblance it hath to meal or flour; and such is often seen in fractures made by bullets, shot out of guns and such fiery Engins. Contrary to these are those fractures which are called *Schidacidon*, as rent into splinters, or after the manner of a boord or peece of timber, that is, right-down, and alongst the bone: and these fractures are either apparent to the eye, or else not apparent, and therefore called Capillarie, being so small, as that they cannot be perceived by the eye, unlesse you put ink upon them, and then shave them with your Scrapers. Sometimes the bone is only pressed down with the stroke, sometimes in the contrary it flyes up, as if it were vaulted. They call it attrition, when the bone is broken into many small fragments, and as it were scales or chips. The fragments of fractured dones are sometimes smooth and polished, otherwhiles unequall, and as it

What *Caryedon*, or *Alphitidon*.

What *Schidacidon*.

were sharp and rough with little teeth, or pricks. Some fractures touch only the surface of the bone, fetching off only a scale; othersome change not the site of fractured bones, but only cleaves them length-wayes, without the plucking away of any fragment; othersome penetrate even to their marrow. Furthermore some fractures are simple and alone by themselves; othersome are accompanied with a troop of other affects and symptomes; as a wound, hæmorrhagie, inflammation, gangrene, and the like. Hereunto you may also adde the differences drawn from the parts which the Fractures possesse; as from the head, ribs, limbs, joints, and other members of the body. Adde also these which are taken from the habit of bodies, aged, young, full of ill humors, well tempered; almost all which have their proper and peculiar indications for curing. Now the causes of Fractures, are the too violent assaults or stroaks of all externall things, which may cut, bruise, break, or shake: in this number of causes may also be reckoned fals from high places, and infinite other things, which would be long and tedious to reckon up.

The causes of fractures.

CHAP. II. *Of the signs of a Fracture.*

WE may know by evident signs that a bone is broken: the first whereof and most certain, is, when by handling the part which we suspect to the broken, we feel peeces of the bone severed asunder, and hear a certain crackling of these peeces under our hands, caused by the attrition of the shattered bones. Another sign is taken from the impotency of the part, which chiefly bewrayes it self, when both the bones, the leg, and brace-bones, the ell and wand are broken. For if only the brace-bone or wand be broken, the Patient may go on his leg, and stir his arm: for the brace-bone serves for the sustaining of the muscles, and not of the body, as the leg bone doth. The third sign is drawn from the figure of the part changed besides nature: for it is there hollow, from whence the bone is flown or gone, but gibbous or bunching out whither it is run. Great pain in the interim torments the Patient by reason of the wronged *periosteum*, and that membrane which involves the marrow and the sympathy of the adjacent parts which are compressed or pricked.

The first sign of a broken bone.

Another.

A third.

CHAP. III. *Of prognosticks to be made in Fractures.*

WE must prognosticate in Fractures whether they are to end in the destruction or welfare of the Patient; or whether their cure shall be long or short, easie, or else difficult and dangerous; and lastly, what accidents & symptomes may happen thereupon. He shall easily attain to the knowledg of all these things, who is not only well seen in the anatomicall description of the bones, but also in the temper, composition and complexion of the whole body. Wherefore in the first place, I think good to admonish the Surgeon of this, that in winter when all is stiffe with cold, by a little fall, or some such sleight occasion, the bones may be quickly and readily broken. For then the bones, being dried, by the dryness of the air encompassing us, become more brittle; which every one of the Vulgar usually observe to happen both in waxen and tallow candles: but when the season is moist, the bones are also more moist, and therefore more flexible and yeelding to the violence of the obvious and offending body. Wherefore also you may gather this to the framing of your Prognosticks, That bones by reason of their naturall drines are not so easily agglutinated and consolidated as flesh; though in Children, according to *Galen*, by reason of the abundance of their humidity, the lost substance may be repaired, according (as they term it) to the first intention, that is, by restoring of the same kind of substance or matter. But in others, about the Fractures a certain hard substance usually concreats, of that nourishment of the broken bone which abounds, which glues together the fragments thereof, being fitly put together. This substance is then termed a *Callus*, and it is so hardened in time, that the bone thereafter in the broken part is seen to be more firm and hard than it is in any other: therefore that usuall saying in Physick is not without reason; That rest is necessary for the uniting of broken bones. For the *Callus* is easily dissolved, if they be moved before their perfect and solid agglutination. The matter of a *Callus* ought to be indifferent and laudable in quantity and quality, even as blood which flowes for the regeneration of the lost flesh in wounds. It is fit, that there may be sufficient matter for such a *Callus*, that the part have a laudable temper, otherwise there either will be no *Callus*, or certainly it will grow more slowly. Fractures are far more easily repaired in young bodies than in old: for in these there is plenty of the primigenious and radicall moisture, that is laudably holding and glutinous; and in the other there is store of watrish and excrementitious. By this you may easily conjecture, that you cannot certainly set down a time necessary for the generating a *Callus*: for in some it happens later, in some sooner: the cause of which variety is also to be referred to the constitution of the year and region, the temper and diet of the Patient, and manner of Ligation. For, those Patients whose powers are weak, and blood watrish and thin, in these the generation of a *Callus* uses to be more slow: On the contrary, strong powers hasten to agglutinate the bones, if there be plenty of grosse and viscous matter; whereby it comes to passe, that meats of grosser nutriment are to be used, and medicins applyed which may help forwards the endeavour of nature, as we shall declare hereafter. When the bones are broken near unto the joints, the motion afterwards uses to be more difficult, especially if the *Callus*, which is substituted, be somewhat thick and bunching forth. But if, together with the violence and force of the Fracture, the joints shall be broken and bruised, the motion will not only be lost, but the life brought in danger, by reason of the greatness of the inflammation, which usually happens in such affects, and the excesse of pain in a tendinous body. These fractures wherein both the bones of the arm or leg are broken, are more difficult to cure, than those which happen but to one of them. For they are handled and kept in their places with more difficulty,

Why bones are more brittle in frostie weather.

VVhy the solution of continuity in bones is not so easily repaired. *Gal. in arte par.*

VVhy bones sooner knit in young bodies.

Meats of grosse and tough nourishment conduce to the generation of a *Callus*.

Fractures at joint dangerous.

ficulty, because that which remains whole, serves the other for a rest or stay to which it may lean. Moreover, there is longer time required to substitute a *Callus* to a great bone, than to a little one. Again these bones which are more rare and spungie, are sooner glued together by the interposition of a *Callus*, than these which are dense and solid. A *Callus* sooner growes in sanguin, than in cholerick bodies. But broken bones cannot be so happily agglutinated, nor restored in any body, but that alwayes some asperity or unequall protuberancy may be seen on that part where the *Callus* is generated. Wherefore the Surgeon ought to make artificiall Ligations, that the *Callus* may not stand out too far, nor sink down too low. That Fracture is least troublesome which is simple; on the contrary, that is more troublesome which is made into splinters; but that is most troublesome and worst of all which is in small and sharp fragments, because there is danger of convulsion by pricking a nerve, or the *periosteum*. Sometimes the fragments of a broken bone keep themselves in their due place: they also oft-times fly forth thereof, so that one of them gets above another; which when it happens, you may perceive an inequality by the depression of the one part and the bunching forth of the other, as also pain by the pricking: besides also the member is made shorter than it was, and than the sound member on the opposite side is, and more swoln by the contraction of the muscles towards their originall. Wherefore when a bone is broken, if you perceive any thing so depressed, presently putting your hand on both sides above and below, stretch forth the bone as forcibly as you can; for otherwise, the muscles and nerves, stretched and contracted, will never of their own accord suffer the bones to be restored to their proper seat and themselves. This extension must be performed in the first dayes, for afterwards there will happen inflammation: which being present, it is dangerous to draw the nerves and tendons too violently; for hence would ensue an impostume, convulsion, gangrene and mortification. Therefore *Hippocrates* forbids you to defer such extension untill the third, or fourth day. Fractures are thought dangerous, whose fragments are great, and fly out, especially in these bones which are filled with marrow on the inside. When broken or dislocated bones cannot be restored to themselves and their naturall place, the part wasts for want of nourishment; both for that the naturall site of the veins, arteries and nerves is perverted, as also because the part it self lies immovable, or scarce movable: whereby it cometh to passe, that the spirits do not freely flow thereto, as neither the nutritive juice cometh thither in sufficient plenty. When the dislocated or broken member is troubled with any great inflammation, it is doubtfull whether or no a convulsion will happen, if we attempt to restore it, or the parts thereof to their seat: therefore it is better, if it may be done, to defer the reducing thereof so long, untill the humor which possesses the part be dissolved, the tumor abated, and the bitterness of pain mitigated.

Hipp. sect. 18. & 19. sect. 1. de fracturis.

Ligations conduce to the handsomnes of a *Callus*.

Extention must presently be made after the bone is broken.

Sent. 36. sect. 3. de fract.

In inflammations the restoring of the bone must not be attempted.

CHAP. IV. *The generall cure of broken and dislocated bones.*

TO cure a broken and dislocated bone, is to restore it to its former figure and site. For the performance whereof, the Surgeon must propose three things to himself: The first is, to restore the bone to its place: The second is, that he contain or stay it being so restored: The third is, that he hinder the increase of malign symptomes and accidents; or else if they do happen, that then he temper and correct their present maligaity. Such accidents are pain, inflammation, a feaver, absceſſe, gangrene and sphacell. For the first intention, you may easily restore a broken or dislocated bone, if presently, as soon as the mischance is got, or else the same day, you endeavour to restore it: for the bitterness of pain or inflammation, which may trouble the Patient, is not as yet very great, neither is the contraction of the muscles upwards as yet very much or stubborn. Therefore first of all, the Patient with his whole body, but especially with the broken or dislocated part, as also the Surgeon, must be in some place which hath good and sufficient light. Then let trusty and skilfull attendants be there, good ligatures, and also, if need so require, good engins. His friends which are present, let them see and hold their peace, neither say, nor do any thing which may hinder the Work of the Surgeon. Then putting one hand above, that is, towards the center of the body, and the other below, as neer as he can to the part affected, let him stretch forth the member: for if you lay your hand any distance from the part affected, you will hurt the sound part by too much compression, neither will you much avail your self by stretching it at such a distance. But if you only endeavour below with your hand or ligature, assisting to make extension thereof, it will be dangerous if there be nothing above which may withstand or hold, lest that you draw the whole body to you. This being done, according as I have delivered, it is fit the Surgeon make a right or streight extension of the part affected: for when the bone is either broken or out of joint, there is a contraction of the muscles towards their originall, and consequently of the bones by them, as it is observed by *Galen*. Wherefore it is impossible to restore the bones to their former seat, without the extension of the muscles. But the part being thus extended, the broken bones will sooner and more easily be restored to their former seat. Which being restored, you shall presently with your hand presse it down, if there be any thing that bunches or stands out. And lastly you shall bind it up, by applying boulsters and splints as shall be fit. But if the bone be dislocated or forth of joint, then presently after the extension thereof, it will be requisite to bend it somewhat about, and so to draw it in. The Surgeon is sometimes forced to use engins for this work, especially if the luxation be inveterate, if the broken or luxated bones be great; and that in strong and rustick bodies, and such as have large joints: for that then there is need of greater strength, than is in the hand of the Surgeon alone. For, by how much the muscles of the Patient are the stronger, by so much will they be contracted more powerfully upwards towards their originals. Yet have a care that you extend them not too violently, lest by rending and breaking asunder the muscles and nerves, you cause the forementioned symptomes, pain, convulsion, a palsie and gangrene: all which sooner happen to strong and aged bodies, than to children, eunuches, women, youths, and generally all moist bodies, for

Three things to be performed in curing broken and dislocated bones.

How to put the bones in their places.

Hipp. sent. 60. sect. 2. de fract.

Adsent. 1. sect. 1. de fract.

When instruments or engins are necessary.

What bodies are sooner hurt by violent extension.

for that they are less hurt by violent extension and pulling, by reason of their native and much humidity and softness. For thus skins of leather, moistened with any liquor, are easily retched, and drawn out as one pleaseth: but such as are dry and hard, being lesse tractable, will sooner rend and tear, than stretch further out. Therefore the Surgeon shall use a mean in extending and drawing forth of members, as shall be most agreeable to the habits of the bodies. You may know the bone is set, and the setting performed as is fit, if the pain be asswaged; to wit, the fibres of the muscles, and the other parts being restored to their former site, and all compression, which the bones moved out of their places have made, being taken away; if, to your feeling there be nothing bunching out, nor rugged, but the surface of the member remain smooth and equall; and lastly, if the broken or dislocated member compares with its opposite in the composure of the joints, as the knees and ancles answer justly and equally in length and thickness. For which purpose it must not suffice the Surgeon to view it once, but even as often as he shall dresse it. For it may happen, that the bone which is well set, may by some chance, as by the Patients unconsiderate turning himself in his bed, or as it were a convulsive twitching of the member or joints whilst he sleeps, the muscles of their own accord contracting themselves towards their originals, that the member may again fall out; and it will give manifest signs thereof by renewing the pain, by pressing or pricking the adjacent bodies: which pain will not cease, before it be restored to its place: and hereof the Surgeon ought to have diligent care. For if, whilst the *Callus* is in growing, one bone ride over another, the bone it self will afterwards be so much the shorter, and consequently the whole member; so that if this errour shall happen in a broken leg, the Patient will halt ever after, to his great grief, and the Surgeons shame. Wherefore the Patient shall take heed, as much as in him lyes, that he stir not the broken member, before that the *Callus* be hardned. Such diligent care needs not be had in dislocations. For these once set, and artificially bound up, do not afterwards so easily fall forth as broken bones. The second scope is, that the bones wich shall be restored may be firmly kept in their state and place. That shall be done by Bandages; as ligatures, boulsters, and other things, whereof hereafter we shall make particular mention. Hither tend proper and fit medicins, to wit, applying of oil of Roses with the whites of Egs, and the like repelling things; and then resolving medicins, as the present necessity shall require. It will be convenient, to moisten your rowlers & boulsters in oxycrate for this purpose, or else in Rose vinegar, if the Fracture be simple, or with red wine, or the like liquor warm (in *Galens* opinion) if a wound be joined to the fracture; and it will be fit to moisten fractures oftner in Summer: For so the part is strengthened, the defluxion being repelled, whereby the inflammation and pain are hindred. You must desist from humecting and watering the part when the symptomes are past, lest you retard the generating of a *Callus*; for which you must labour by these means which we shall hereafter declare. To this purpose also conduces the rest and lying of the part in its proper figure and site accustomed in health, that so it may the longer remain in the same place unstirred. Besides also, it is expedient then only to dresse the part, when it is needfull, and with those things that are requisite, shunning, as much as may be, inflammation and pain. That figure is thought the best, which is the middle, that is, which contains the muscles in their site, which is without pain; so that the Patient may long endure it without labour or trouble. All these things being performed, the Patient must be asked, whether the member be bound up too strait? If he answer, No, (unlesse peradventure a little upon the fracture or luxation, for there it is fit it should be more straitly bound) then may you know that the binding is moderate. And this same first ligation is to be kept in fractures without loosing for three or four dayes space, unlesse peradventure pain urge you to the contrary. In dislocations the same binding may be kept for seven or eight dayes, unless by chance some symptome may happen, which may force us to open it before that time: for the Surgeon must with all his art have a care to prohibit the happening of evill accidents and symptomes, which, how he may bring to passe, shall be declared in the following Chapter.

Causes and signs of the relapse of a set bone.

Ad sent. 21. sect. 1. de fract.

What the middle figure is and why best.

Fit time for loosing of Ligatures in fractures and dislocations.

CHAP. V. *By what means you may perform the third intention in curing fractures and dislocations, which is, the hindring and correction of accidents and symptomes.*

Your choice means to hinder accidents.

THat we may attain unto this third scope, it is requisite we handle as gently and without pain, as we may, the broken or dislocated member, we drive away the defluxion ready to fall down upon the part by medicins, repelling the humor, and strengthening the part; we, by appointing a good diet, hinder the begetting of excrements in the body, and divert them by purging and phlebotomy. But if these accidents be already present, we must cure them according to the kind and nature of each of them: for they are various. Amongst which is reckoned itching, which in the beginning torments the Patient: this ariseth from a collection and suppression of subacrid vapours, ariling from the blood, and other humors under the skin. Whence a light biting, which causeth a simple itch, or else a more grievous and acrid one, from whence (in *Galens* opinion) proceeds a painfull itching. Wherefore such matter, as the cause, being evacuated, all itching ceaseth. But this cannot easily and freely be evacuated and breathed out, because the pores of the part are shut up, and as it were oppressed with the burden of the emplaisters, boulsters, and ligatures, which are put about the part. Hereunto may be added, that the part its self doth not so perfectly perform and enjoy its wonted faculties and actions: by which it commeth to passe, that the heat thereof is more languid than may suffice to discusse the suliginous matter there collected. Wherefore it will be convenient to loose the ligatures every third day, that as by loosing their tyes, their sanious and suliginous excrements, shut up under the skin, may freely passe forth, lest in continuance they should fret and ulcerate it; as it happens to most of those who provide not for it by loosing their ligatures. Besides also, the part must be long fomented with hot water alone, or else with a decoction of sage, chamomile, roses,

The causes and differences of itching.

Ad sent. 4. sect. 1. de fract.

Remedies against the itching.

roſes,and melilot made in wine and water : for long fomenting attenuates and evacuates, but ſhorter ſils and mollifies,as it is delivered by *Hippocrates*. Alſo gentle frictions, performed with your hand, or a warm linnen cloth upwards, to the right ſide and left, and circularly to every ſide, are good. But if the skin be already riſen into bliſters,they muſt be cut,leſt the matter contained thereunder may corrode and ulcerate the skin:then muſt the skin be anointed with ſome cooling and drying medicin; as,*ung. album Camphoratum Rhaſis,Deſiccativum rubrum,unguentum roſatum ſine aceto*;adding thereto the powder of a rotten poſt,or prepared *Tutia*,or the like.Other accidents more grievous than theſe, do often happen,but we will treat of them hereafter.But if the ſcales of the bone underneath be quite ſevered from the whole,then muſt they be preſently taken forth,eſpecially if they prick the muſcles:but if the bone be broken into ſplinters,and ſo prominent out of the wounded fleſh as that it cannot be reſtored into its ſeat,it muſt be cut off with your cutting mallets, or parrats beak, as occaſion ſhall offer its ſelf.In the interim,you muſt have a care that the part enjoy perſpiration, and by change of place and riſing,now and then it may be as it were ventilated : alſo you muſt ſee that it be not over-burdened, neither too ſtrait bound, otherwiſe it will be apt to inflammation. Thus much concerning fractures and diſlocations in generall : now we muſt deſcend to particulars, beginning with the fracture of the Noſe.

Hipp ſent. 46 ſect. 3. de fract.

CHAP. VI. *Of the Fracture of the Noſe.*

THe Noſe is griſtly in its lower part,but bony in the upper. Wherefore it ſuffers no fracture in the griſtly part(unleſs peradventure a *Sedes*)but only a depreſſion,diſtortion or contuſion.But a fracture often happens to the bony part,and ſo great a depreſſion to the inner ſide, that unleſs it be provided for by diligent reſtoring it, the noſe will become flat, or wreſted aſide,whence there will be difficulty of breathing. That this kind of fracture may be reſtored,that bone which ſtands too far out,muſt be preſſed down ; but that which is depreſt, muſt be lifted up with a ſpathern,or little ſtick handſomely faſhioned and wrapped about with cotten or a linnen rag,ſo to avoid pain. Therefore you ſhall hold the ſpathern in one hand, and reduce and order it with the other.The bone being reſtored, directories or tents of a convenient bigneſs ſhall be put into the noſe;which tents ſhall be made of ſponge, or flax, or a peece of a beaſts or ſheeps lungs. For theſe things are ſoft,and do not only hinder the bones of the Noſe that they fall no more, but alſo liſt them up higher. And then the Noſe ſhall be in ſome ſort ſtayed with boulſters on each ſide, even untill the perfect agglutination of the bones,leſt the figure and ſtraitneſs ſhould be vitiated and ſpoiled. I have oft-times put golden,ſilver and leaden pipes into fractured noſes, and faſtned them with a thred to the Patients night-cap, which, by one and the ſame means, kept the bones from being again depreſt,gave the matter free paſſage forth,and nothing hindred the breathing. In the mean time we muſt ſee,that we do not preſſe the Noſe with too ſtrait binding,unleſſe peradventure ſome other thing perſwade;leſt they become either too wide,too flat,or crooked. If any wound accompany the fracture,that ſhall be cured after the ſame manner,as the wounds of the head. The fracture reſtored, the following medicin,which hath a faculty to repel and repreſſe the defluxion,to ſtrengthen and keep the part in its due poſture,and to dry up and waſt the matter which hath already fallen down, ſhall be applyed to the Noſe,and all the other dry parts. ℞ *thuris, maſtiches, boli armeniæ, ſanguinis draconis, an.* ℥ß. *aluminis rochæ,reſinæ pini an.* ʒij. *pulveriſentur ſubtiliſſimè* : Or elſe, ℞ *farinæ volatilis* ℥ß. *albuminum ovorum quantum ſufficit,incorporentur ſimul,& fiat medicamentum.*

Hipp. ſent. 46. ſect. 2. de art.

How to reduce the noſe into its naturall figure.

A fit aſtringent and dey ing medicin.

Neither ſhall you uſe any other art to cure the cartilagineous part of the noſe being fractured. Wherefore *Hippocrates* termes that ſolution of continuity what there happens, A fracture, as if it were in a bone;becauſe he could find no other name more fitly to expreſſe it:for a griſtle, next to a bone,is the hardeſt of all the parts of our body. A *Callus* uſes to grow in fractured noſes, unleſſe ſomething hinder within the ſpace of twelve or fifteen dayes.

Sent. 47. ſect. 2. de art. & Gal. in Com.

CHAP. VII. *Of the fracture of the lower Jaw.*

THe lower Jaw runnes into two,as it were,horns or tops : the one whereof ends ſharp, and receives a tendon from the temporall muſcle ; the other ends blunt and round under the mammillary proceſs,and it is there implanted in a ſmall cavity;it is joined together in the middle of the chin by *Symphyſis*, and is marrowie within.The Fracture,which happens thereto,is reſtored by putting your fingers into the Patients mouth, and preſſing them on the inſide and outſide,that ſo the fractured bones put together may be ſmoothed and united. But if they be broken wholly athwart,ſo that the bones lye over each other, extenſion muſt be made on both ſides on contrary parts,upwards and downwards, whereby the bones may be compoſed and joined more eaſily to one another. The teeth in the mean while, if they be either ſhaken or removed out of their ſockets,muſt be reſtored to their former places, and tyed with a gold or ſilver wyer, or elſe an ordinary thred, to the next firm teeth,untill ſuch time as they ſhall be faſtened,and the bones perfectly knit by a *Callus*. To which purpoſed the ordered fragments of the fractured bone ſhall be ſtayed, by putting a ſplint on the out ſide,made of ſuch leather as ſhoe ſoals are made ; the midſt thereof being divided at the Chin,and of ſuch length and breadth as may ſerve the Jaw : then you ſhall make ligation with a ligature two fingers broad, and of ſuch length as ſhall be ſufficient, divided at both the ends;and cut longwayes in the midſt thereof;that ſo it may engirt the chin on both ſides. Then there will be four heads of ſuch a ligature ſo divided at the ends;the two lower whereof being brought to the crown of the head,ſhall be there faſtned and ſowed to the Patients night-cap. The two upper

A deſcription of the lower Jaw. The manner of reſtoring a broken Jaw.

The deſcription of a fit ligature for the under Jaw.

drawn athwart shall likewise be sowed as artificially as may be, to the cap in the nape of the neck. It is a most certain sign, that the Jaw is restored and well set, if the teeth fastened therein stand in their due rank and order. The Patient shall not lye down upon his broken jaw, lest the fragments of the bones should again fal out, and cause a greater defluxion. Unlesse inflammation, or some other grievous symptome shall happen, it is strengthened with a *Callus* within twenty dayes; for that it is spungious, hollow, and full of marrow, especially in the midst thereof: yet sometimes, it heals more slowly, according as the temper of the Patient is, which takes also place in other fractured bones. The agglutinating and repelling medicin, described in the former chapter, shall be used; as also others, as occasion shall offer it self. The Patient must be fed with liquid meats, which stand not in need of chewing, untill such time as the *Callus* shall grow hard, lest the scarce or ill-jointed fragments should fly in sunder with the labour of chewing. Therefore shall he be nourished with water-grewell, ponadoes, cullasses, barley creams, gellies, broths, rear egs, restaurative liquors, and other things of the like nature.

In what time it may be healed.

CHAP. VIII. *Of the fracture of the Clavicle or Collar-bone.*

Hipp. sent. 63 sect. 1. desr.

AS the nature and kind of the fractured Clavicle shall be, so must the cure and restoring thereof be performed. But howsoever this bone shall be broken, alwayes the end fastned to the shoulder and shoulderblade, is lower than that which is joined to the chest; for that the arm drawes it downwards. The collar-bone, if broken athwart, is more easily restored and healed, than if it be cloven long-wayes. For, every bone broken athwart doth more easily return into its former state or seat, whiles you lift it up on this or that side with your fingers. But that which is broken *scbidasidon*, or into splinters, or long-wayes, is more difficultly joined and united to the ends and fragments: for those peeces, which were set, will be plucked asunder, even by the least motion of the armis; and that which was knit with the shoulder, will fall down to the lower part of the breast. The reason of which is, the collar-bone is not moved of its self, but consents in motion with the arm. In restoring this or any other fracture, you must have a care that the bones ride not one over another, neither be drawn nor depart too farre in sunder: therefore it will be here convenient, that one servant draw the arm backwards, and another pull the shoulder towards him the contrary way; for so there will be made, as I may so term it, a counter-extension. While which is in doing, the Surgeon with his fingers shall restore the fracture, pressing down that which stood up too high, and lifting up that which is pressed down too low. Some, that they may more easily restore this kind of fracture, put a clew of yarn under the Patients arm-pit; so to fill up the cavity thereof: then they forcibly presse the elbow to the ribs, and then force the bone into its former seat. But if it happen, that the ends of the broken bones shall be so depress, that they cannot be drawn upwards by the forementioned means: then must the Patient be laid with his back, just between the shoulders, upon a pillow hard stuffed, or a tray turned with the bottome upwards, and covered with a rug or some such thing. Then the servant shall so long presse down the Patients shoulders with his hands, untill the ends of the bones, lying hid and pressed down, fly out and shew themselves. Which being done, the Surgeon may easily restore or set the fractured bone. But if the bone be broken so into splinters that it cannot be restored, and any of the splinters prick and wound the flesh, and so cause difficuty of breathing, you then must cut the skin even against them, and with your instrument lift up all the depressed splinters, and cut off their sharp points; so to prevent all deadly accidents, which thereupon may be feared. If there be any fragments, they, after they are set, shall be covered with a knitting medicin made of wheat floure, frankincense, bole armenick, *sanguis draconis*, *resina pini*, made into powder, and mixed with the whites of egs, putting upon it splints, covered with soft worn linnen rags; covered over likewise with the same medicin, and then three boulsters dipped in the same; two whereof shall be laid upon the sides, but the third and thickest upon the prominent fracture, so to represse it and hold it in. For thus the fragments shall not be able to stir or lift themselves up further than they should, either to the right side or left. Now these boulsters must be of a convenient thickness and breadth, sufficient to fill up the cavities which are above and below that bone. Then shall you make fit ligation with a rowler, having a double head cast crosse-wise, of a hands breadth, and some two ells and a half long, more or less, according to the Patients body. Now he shall be so rowled up, as it may draw his arme somewhat backwards, and in the interim his arm-pits shall be filled with boulsters, especially that next the broken bone; for so the Patient may more easily suffer the binding. Also you shall wish the Patient, that he of himself bend his arm backwards, and set his hand upon his hip, as the Country Clownes use to do, when they play at leap-frog. But how great diligence soever you use in curing this sort of fracture, yet can it scarce be so performed, but that there will some deformity remain in the part: for that a ligature cannot be rowled about the collar-bone, as it may about a leg or an arme. A *Callus* oft-times growes on this bone, within the space of twenty dayes, because it is rare and spongious.

How to restore the fractured Clavicle.

The first way.

The second way.

The third way.

How to bind up the fractured clavicle.

It is a difficult matter perfectly to restore a fractured clavicle.

CHAP. IX. *Of the fracture of the shoulder-blade.*

THe Greeks call that *Omoplata*, which the Latines terme *Scapula*, or *Scapule patella*, that is, the shoulder-blade. It is fastned on the back to the ribs, nowle, the *Vertebræ* of the chest and neck; but not by articulation, but only by the interposition of muscles, of which we have spoken in our Anatomie. But on the forepart it is articulated after the manner of other bones with the collar-bone, the shoulder, or arm-bone: for with its processe, which represents a prick or thorn, and by some, for that it is more long and prominent, is called *Acromion*; (that is, as you would say, the top or spire of the said shoulder-blade) it receives the collar-bone. Therefore some Anatomists, according to *Hippocrates*, as they suppose, call all this articulation of the collar-bone with the hollowed processe

An anatomicall description of the shoulder blade.

ceſs of the ſhoulder-blade, *Acromion*. There is another proceſs of the ſaid blade-bone, called *Cervix omoplatæ*, or the neck of the ſhoulder-blade; this truly is very ſhort, but ending in a broad inſinuated head, provided for the receiving of the ſhoulder or arm bone. Not far from this proceſs is another, called *Coracoides*, for that the end thereof is crooked like a Crows beak. This keeps the ſhoulder bone in its place, and conduces to the ſtrength of that part. The ſhoulder blade may be fractured in any part thereof, that is, either on the ridge, which runs like a hill, alongſt the midſt thereof for its ſafety, as we ſee in the *vertebræ* of the back. So alſo in the broader part thereof it may be thruſt in and depreſt; and alſo in that articulation, whereby the top of the ſhoulder is knit to it. According to this variety of theſe fractured parts, the happening accidents are more grievous or gentle.

How many wayes the ſhoulder blade may be broken.

We know the ſpine or ridge of the ſhoulder-blade to be broken, when a dolorificke inequality is perceived by touching or feeling it. But you may know, that the broader or thinner part thereof is depreſſed, if you feel a cavity, and a pricking paine moleſt the part, and if a numneſſe trouble the arme, being ſtretched forth. The fragments, if they yet ſtick to their bones and do not prick the fleſh, muſt be reſtored to their ſtate and place, and there kept with agglutinative medicines, and ſuch as generate a *Callus*, as alſo with boulſters and rowlers fitted to the place. But if they do not adhere to the bone, or pricke the fleſh lying under them, then muſt you make inciſion in the fleſh over againſt them, that ſo you may take them out with your Crows beak. But although they ſtir up and down, yet if they ſtill adhere to the *periſteum* and ligaments, (if ſo be that they trouble not the muſcles by pricking them) then muſt they not be taken forth: for I have oftner than once obſerved, that they have within ſome ſhort time after grown to the adjacent bones. But if they, being wholly ſeparated, do not ſo much as adhere to the *periſteum*, then muſt they neceſſarily be plucked away; otherwiſe within ſome ſhort ſpace after, they will be driven forth by the ſtrength of nature, for that they participate not any more in life with the whole. For that which is quick, ſaith *Hippocrates*, uſes to expell that which is dead far from it. The truth whereof was manifeſted in the Marques of *Villars*, who at the battell of *Dreux* was wounded in his ſhoulder with a Piſtoll bullet, certain ſplinters of the broken bone were plucked forth with the pieces of his harneſſe, and of the leaden bullet; and within ſome ſhort ſpace after, the wound was cicatrized, and fully and perfectly healed. But more than ſeven years after, a deflaxion and inflammation ariſing in that place by reaſon of his labour in arms, and the heavineſs of his armour at the battell of *Mont-contour*, the wound broke open again; ſo that many ſhivers of the bone, with the reſidue of the leaden bullet, came forth of themſelves. But if the fracture ſhall happen in the neck of the ſhoulder-blade or dearticulation of the ſhoulder, there is ſcarce any hope of recovery; as I have obſerved in *Anthony* of *Burbon*, King of *Navarre*; *Francis* of *Lorrain*, Duke of *Guiſe*; the Count *Rhingrave Philibert*, and many other in theſe late civill Wars. For there are many large veſſels about this dearticulation, to wit, the axillary vein and artery, the nerves ariſing from the *Vertebræ* of the neck, which are thence diſſeminated into all the muſcles of the arm. Beſides, alſo inflammation and putrefaction ariſing there are eaſily communicated by reaſon of their neighbour-hood to the heart and other principal parts, whence grievous ſymptoms, and oft-times death it ſelfe enſues.

The cure.

Lib. de vul. capitis. A hiſtory.

Nature of its own accord makes it ſelfe way to caſt forth ſtrange bodies and matters.

Why a fracture in the joint of the ſhoulder is deadly.

CHAP. X. *Of the fracture and depreſſion of the* Sternon, *or Breaſt-bone.*

THe *Sternum* is ſometimes broken, other whiles onely thruſt in without a fracture. The inequality perceivable by your feeling, ſhewes a fracture, as alſo the going in with a thruſt with your finger, and the ſound or noiſe of the bones crackling under your fingers. But a manifeſt cavity in the part, a cough, ſpitting of bloud, and difficulty of breathing by compreſſion of the membrane inveſting the ribs and the lungs, argue the depreſſion thereof. For the reſtoring of this bone, whether broken or depreſt, the Patient muſt be laid on his back with a cuſhion ſtuffed with tow or hay under the *vertebræ* of the back, as we ſet down in the ſetting of the collar bone. Then a ſervant ſhall lie ſtrongly with both his hands on his ſhoulders, as if he would preſs them down, whileſt the Surgeon, in the mean time preſſing the ribs on each ſide, ſhall reſtore and ſet the bone with his hand; and then the formerly deſcribed medicines ſhall be applyed for to hinder inflammation, and aſſwage pain; boulſters ſhall be fitted thereto, and a ligature ſhall be made croſſe wayes above the ſhoulders, but that not too ſtrait, leſt it hinder the Patients breathing. I by theſe means, at the appointment of *Anthony* of *Burbon* King of *Navar*, cured *Anthony Benand* a Knight of the order, who had his breaſt-plate bended and driven in, with an iron bullet ſhot out of a Field-peece, as alſo his *ſternum* together therewith, and he fell down as dead with the blow; he did ſpit bloud for three months after I had ſet the bone: yet for all this he lives at this day in perfect health.

Signs that the *ſternum* is broken. Signs that it is depreſſ. The cure.

A hiſtory.

CHAP. XI. *Of the fracture of the ribs.*

THe true ribs, for that they are bony, may be broken in any part of them. But the baſtard ribs cannot be truly broken unleſſe at the back bone, becauſe they are only bony in that part, but griſtly on the foreſide toward the breaſt bone; wherefore there they can only be folded or crooked in. Theſe which are ſubject to fractures, may be broken inwards and outwards. But oft-times it comes to paſs, that they are not abſolutely broken, but cleft into ſplinters, and that ſometimes inwards, but not outwards. Thus the fiſſure doth oft-times not exceed the middle ſubſtance of the rib; but ſometimes it ſo breaks through it all, that the fragments and ſplinters do prick and wound the membrane, which inveſts and lines them on the inſide, and then there is great danger. But when the fracture is ſimple without a wound, compreſſion, puncture of the membrane, and laſtly, without any other ſymptome; then the danger is leſſe. Therefore *Hippocrates* wiſheth, that theſe, who are thus affected, fill themſelves more

In what place the ſhort ribs may be broken.

Sect. 56. fect. 3. de art.

more freely with meat; for that moderate repletion of the belly, is (as it were) a certain prop or ſtay for the ribs, keeping them well in their place and ſtate; which rule chiefly takes place in fractures of the baſtard ribs. For ſuch as have them broken, uſually feel themſelves better after, than before meat. For emptineſs of meat, or of the ſtomach, makes a ſuſpenſion of the ribs, as not underpropped by the meat. Now that fracture which is outwardly, is far more eaſie to heal, than that which is inwardly; for that this prickeeth the membrane or *Pleura*, and cauſeth inflammation, which may eaſily end in an *Empyema*. Adde hereunto, that this is not ſo eaſily to be handled or dealt withall, as the other: whereby it commeth to paſs, that it cannot be ſo eaſily reſtored; for that theſe things cannot be ſo fully and freely performed in this kinde of fracture, which are neceſſary to the ſetting of the bone, as to draw it out, hold it and join it together. It is therefore healed within twenty dayes, if nothing elſe hinder. The ſigns of fractured ribs are not obſcure; for by feeling the grieved part with your fingers, you may eaſily perceive the fracture by the inequality of the bones, and their noiſe or crackling, eſpecially if they be quite broke aſunder. But if a rib be broken on the inſide, a pricking pain, far more grievous then in a pluriſie, troubles the Patient; becauſe the ſharpe ſplinters prick the Coſtall membrane: whence great difficulty in breathing, a cough, and ſpitting of bloud enſue. For bloud, flowing from the veſſels broken by the violence of the thing cauſing the fracture, is (as it were) ſucked up by the lungs, and ſo by a dry cough carryed into the weazond, and at length ſpit out of the mouth. Some, to pull up the bone that is quite broken and depreſt, apply a cupping glaſſe, and that is ill done; for there is cauſed greater attraction of humours, and exceſs of pain by the preſſure and contraction of the adjacent parts, by the cupping glaſs, wherefore *Hippocrates* alſo forbids it. Therefore it is better to endeavour to reſtore it after this following manner. Let the Patient lye upon his ſound ſide, and let there be laid upon the fractured ſide an emplaiſter made of Turpentine, Roſin, black Pitch, wheat flour, maſtick, and aloes, and ſpread upon a ſtrong and new cloth. When it hath ſtuck there ſome time, then pluck it ſuddenly with great violence from below upwards; for ſo the rib will follow together therewith, and be plucked and drawn upwards. It is not ſufficient to have done this once, but you muſt do it often, untill ſuch time as the Patient ſhall finde himſelfe better, and to breath more eaſily. There will be much more hope of reſtitution, if, whileſt the Surgeon do this diligently, the Patient forbeare coughing, and hold his breath. Otherwiſe if neceſſity urge, as if ſharp ſplinters with moſt bitter tormenting pain prick the Coſtall membrane overſpread with many nerves, veins, and arteries, which run under the ribs, whence difficulty of breathing, ſpitting of bloud, a cough and fever enſue; then the only way to deliver the Patient from danger of imminent death, is to make inciſion on the part where the rib is broken, that ſo laying it bare, you may diſcern the pricking fragments, and take them out with your inſtrument, or elſe cut them off. And if you make a great wound by inciſion, then ſhall you ſew it up, and cure it according to the common rules of curing wounds. Now diet, phlebotomy, and purgation, which (as *Hippocrates* ſaith) are not very needfull in a ſimple fracture, for that there are no ſymptomes which may require ſuch remedies; yet they, by reaſon of the complicated ſymptomes, as a convulſion, feaver, *Empyema*, and the like, muſt here be preſcribed by the advice of the Phyſitian which overſees the cure. A Cerate, and other remedies fitting the occaſion, ſhall be applyed to the grieved part: no other ligatures can be uſed, than ſuch as are fit to hold faſt and ſtay the locall medicins. There is no other rule of ſite and lying, than ſuch as is taken from the will and content of the Patient.

VVhy an internal fracture of the ribs is deadly.

The ſignes.

The cauſe of ſpitting bloodwhen the ribs are broken.

Sect. 15. ſect. 3. de art. Paulus lib. 6. cap. 96. Avicen. 4.

The cure.

A ſimple fracture may be cured only by Surgery.

CHAP. XII. *Of certain preternaturall affects which enſue upon broken ribs.*

MAny ſymptomes enſue upon fractured and contuſed ribs; but amongſt the reſt, there are two which are not common, whereof we will treat in this place. The firſt is, the inflation, or riſing up of the contuſed fleſh, which alſo enſues upon light affects of the bone, which have been neglected at the beginning. But the fleſh is not meerly puffed up of it ſelfe, but alſo with a certain phlegmatick, glutinous and viſcous humour gathering thereinto. The cauſe hereof is, the weakneſs of the digeſtive faculty of the part, occaſioned by the ſtroak and diſtemper; which therefore cannot aſſimilate the nouriſhment flowing more plentifully than it was wont, either drawn thither by means of the pain, or ſent thither by a blinde violence of nature, ſtirred thereto by a deſire of its own preſervation. Wherefore this halfe crude humor remaining there, raiſeth much flatuling from its ſelfe, or elſe wrought upon by the weaker heat, it is reſolved into cloudy vapours; whence it cometh to paſs, that the fleſh is ſwoln up in that place, and the skin on the contrary grows ſoft, as if it were blown up with a quil. Therefore laying your hand thereon, you may hear the noiſe of the winde going forth thereof, and ſee a cavity left in the part, as it is uſually ſeen in œdematous tumors. Unleſs you remedy this inflation, there will enſue an inflammation, feaver, abſceſs, difficulty of breathing; and laſtly, that ſecond kind of affect whereof we have determined to treat in this chapter, to wit, the putrefaction, corruption, or blaſting of the ribs. An abſceſſe, and the ſeparation of the fleſh from the bone is the cauſe hereof: for hence it cometh to paſs that the bone, deſpoiled of its naturall and fleſhly cloathing wherewith it was cheriſhed, is eaſily offended by the touch of the entring air, which it never formerly felt, and ſo at length it becometh (as it were) blaſted: which when it happens, they ſpit up filth, and ſo fall into a conſumption, and at length die. To withſtand all theſe inconveniencies, you muſt as ſpeedily as you can, reſtore the fractured bones by the former delivered means. And then this mucous tumor muſt be reſolved by proper heating and diſcuſſing medicins, and kept down by boulſters and rowlers; that ſo the fleſh may touch the bone, and cover it as it uſually did. But the ligature ſhall not be made ſo ſtrait, as to hinder the ribs from their wonted motion in expiration and inſpiration. If the tumor degenerate into an abſceſs, it ſhall be ſpeedily opened, leſt the matter, kept in too long, corrupt the bone which lyes under it, by the contagion of its putrefaction. The ulcer being opened, the matter ſhall be evacuated by putting a pipe into the ulcer; the end whereof ſhall be bound about with a thred, leſt it fall into the capacity of the cheſt, and that it may be drawn forth at your pleaſure.

The cauſe.

The ſignes.

The cure.

CHAP.

CHAP. XIII. *Of the fracture of the Vertebræ, or rack bones of the back, and of their processes.*

THe *vertebræ* are some whiles broken, otherwhiles bruised, or strained on the inside, whereby it cometh to pass, that the membranes which invest the spinall marrow, as also the spinall marrow it self, are compressed and straitned, which cause many malign accidents; which, whether they be curable or not, may be certainly foretold by their magnitude. Amongst these symptomes, are the stupidity, or numness and palsie of the arms, legs, fundament, and bladder, which diminish, or else take away from them the faculty of sense and motion; so that their urine and excrements come from them against their wils and knowledg, or else are wholly suppresst. Which when they happen (saith *Hippocrates*) you may foretell that death is at hand, by reason that the spinall marrow is hurt. Having made such a prognostick, you may make an incision, so to take forth the splinters of the broken *vertebræ*, which driven in, press the spinall marrow, and the nerves thereof. If you cannot do this, at least you shall apply such medicins as may asswage pain, and hinder inflammation; and then the broken bones shall be restored to their places, and contained therein by those means which we shall mention when we come to treat of the luxation of the spine. But if that the processes only of the *vertebræ* be broken, the fragments shall be put in their places, unless they be quite severed from their *periosteum*. But if they be severed, you shall open the skin and take them forth, and then dress the wounds as is fit. We understand that only the processes of the *vertebræ* are broken, if in the absence of the forementioned symptoms of numness and the palsie, you laying your finger upon the grieved part, feel something, as a bony fragment, shaking and moving thereunder, with a certain crackling noise, and cavity, and depression; and then, if when the Patient holds down his head, and bends his back, he feel far more pain, than when he stands up streight upon his feet. For in stooping, the skin of the back is somewhat stretched forth, and extended, and also forced upon the sharp splinters of the fragments, whence proceeds a dolorifick solution of continuity, and a pricking: in standing streight up, on the contrary, the stretched skin is relaxed, and consequently less molested by the sharp fragments. The fractured processes of the *vertebræ* easily heal, unless they be associated with some other more grievous symptome which may hinder; such as is a certain great contusion, and the like. For as we formerly said out of *Hippocrates*, all rare and spongy bones are knit by a *Callus* within a few dayes.

The affects of the *vertebræ*.

Sect. 2. Prorh.

The cure of fractured *vertebræ*.

The cure of the processes.

Signs that onely the processes are fractured.

CHAP. XIV. *Of the fracture of the holy-bone.*

ALso the holy bone in a certain part thereof, which may be easily healed, may be broken by the blow of bruising things, as by a bullet shot out of a musket, as I have observed in many. But if the fracture violate, together with the *vertebræ* thereof, the spinall marrow contained therein, then the Patient can scarce scape death, for the reasons shewed in the former chapter.

What fracture of the holy bone curable, and what not.

CHAP. XV. *Of the fracture of the rump.*

THe Rump is composed of four bones; the first whereof hath a cavity, wherein it receives the loweſt *vertebræ* of the holy bone; the other three are joined together by *Symphyſis* or Coalition; at the end of these hangs a certain small gristle. The fracture of these bones shall be cured by putting your finger into the Patients fundament, and so thrusting it even to the fractured place. For, thus you may thrust the fragment forth, and fit and restore it to the rest of the bones by your other hand lying upon the back. But that it may be the sooner healed, it is fit the Patient keep his bed, during all the time of the cure. But if there be a necessity to rise, he shall so sit in a perforated seat, that there may be nothing which may press the broken part; and fitting remedies for healing fractures shall be applyed as occasion shall offer it selfe.

The description of the rump.

The cure.

CHAP. XVI. *Of the fracture of the Hip, or* Os Ilium.

THe Hip consists of three bones: the first is named *Os Ilium*, the haunch bone; the other, *Os Iſchion*, the huckle bone; the third *Os pubis*, the share bone. These three bones in men of full growth are so fast knit and joined together, that they can by no means be separated; but in children they may be separated without much a do. This bone may be broken in any part thereof, either by a stroak, or by a fall from high upon any hard body. You shall know the fracture by the same kind of signs, as you know others, to wit, pain, pricking, a depressed cavity, and inequality, and also a numness of the leg of the same side. The splinters of the bones (if quite broke off) must by making incision be taken away at the first dressing; in performance of which operation, you must have a care that you hurt not with your instrument the heads of the muscles, nor any vessels, especially which are great; nor lastly, that large nerve which is sent into the muscles of the thigh and leg. On the contrary, such fragments as are not broken or severed from their *periosteum*, shall be smoothed and set in order with your fingers, as is fitting. Other things shall be done according as art and necessity shall perswade and require.

The description of the hip.

The signes.

The cure.

CHAP. XVII. *Of a fracture of the shoulder, or arm bone.*

THe Arm bone is round, hollow, full of marrow, rising up with an indifferent neck, and ending on the upper part into somewhat a thick head. On the lower part it hath two processes, the one before, the other behinde; between which there is (as it were) an half circle, or the cavity of a pulley, each end whereof leads into its cavity, of which one is interior, another exterior; that by these (as it were) hollow stops, the bending and extension of the arm might be limited, lest that the bone

The description of the arm, or shoulder bone.

bone of the cubit, if the circle should have been perfect, sliding equally this way and that way, might, by its turning, have gone quite round, as a rope runs in a pulley; which thing would much have confused the motion of the cubit. For so the extension, or bending it back, would have been equall to the necessary bending it inwards. It is very expedient that a Surgeon know these things, that so he may the better know how to restore the fractures and luxations of this part. If one of the fragments of this broken bone shall lye much over the other, and the Patient have a good strong body, then the arm shall be much extended, the Patient being so set upon a low seat, that he may not rise, when the fracture shall be a setting, and so hinder the begun work; and also, that so the Surgeon may the more easily perform his operation upon the Patient seated under him; yet *Hippocrates* regarding another thing, would have the Patient to sit higher. But you must have a care that the shoulder bone it self be drawn directly downwards, and the cubit so bended as when you put it into a scarf. For if any one set this bone, lifting the arm upwards, or otherwise extending it, then must it be kept in that posture; for otherwise, if the figure be changed, the setting will quickly be spoiled, when as you come to put the arm in a scarf. Wherefore the Surgeon must diligently and carefully observe that in setting a broken arm, he put it in such a posture, that resting on the breast, it look down towards the girdle. You must have a care in laying the splints, and rowling your ligatures, that they hurt not, nor press too hard upon the joints. For, in the opinion of *Hippocrates*, by the pressure of parts which are nervous, fleshless, and consequently endued with exquisite sense, by the splints there is danger of most grievous pain, inflammation, denudation both of the bone and nerve; but chiefly, if such compression hurt the inner part, towards which the arm is bended; wherefore the splints made for this place must be the shorter. Therefore after the arm-bone is set, the arm shall be laid upon the breast in a right angle, and there bound up in a scarf, lest that the Patient, when he hath need to stir, spoil and undo the setting, and figure of the broken bone. But the arm must be kept in quiet, untill such time as the fragments shall be confirmed with a *Callus*, which usually is in forty dayes, sooner or later, according to the different constitutions of bodies.

The cure.

How the arm must be placed when the bone is set.

Sect. 3. offic. sect. 1. de fract.

In what time it will knit.

CHAP. XVIII. *Of the fracture of the Cubit, or the Ell and Wand.*

The differences.

IT sometimes happeneth, that the cubit and wand are broken together and at once, and otherwhiles that but the one of them is fractured. Now they are broken either in their midst or ends; their ends (I say) which are either towards the elbow, or else towards the wrist. That fracture is worst of all, wherein both the bones are broken, for then the member is made wholly impotent to perform any sort of action, and the cure is also more difficult; for the member cannot so easily be contained in its state: for that bone which remains whole, serves for a stay to the arm, and hinders the muscles from being drawn back, which usually draw back and shrink up themselves, whensoever both bones are broken. Hence it is, that that fracture is judged the worst, wherein the cubit or ell bone is broken. But that is easiest of all, wherein only the wand is broken, for so the fractured part is sustained by the ell bone: when both the bones are broken, there must be made a stronger extension, for that the muscles are the more contracted. Therefore, whensoever either of them remains whole, it doth more service in sustaining the other, then any either ligatures or splints, for that it keeps the muscles right in their places. Wherefore, after the bones shall be set and rowled up with ligatures and splints, the arm must be so carryed up in a scarf put about the neck, that the hand may not be much higher than the elbow, lest the blood and other humours may fall down thereinto. But the hand shall be set in that posture which is between prone and supine, for so the wand shall lye directly under the ell, as we have read it observed by *Hippocrates*. The reason is, for that by a supine figure or situation, both the bone and muscles are perverted: for first, for the bone, the *Apophysis*, *Styloides* and *Olecranum* of the cubit, ought to be in an equall plain, and to be seated each against other; which is not so in a supine figure, as wherein the *Processus styloides* of the cubit is set against the inner process of the arm bone. But in muscles, for that, like as the insertion and site of the head of a muscle is, such also is the site of the belly thereof, and lastly, such the insertion of the tail thereof; but by a supine figure, the muscles arising from the inner process of the arm bone and bending the cubit, shall have the tail placed in an higher and more exteriour site. In the *interim*, you must not omit, but that the Patients arm may, with as little pain as possible you can, be bended and extended now and then, lest by the too long rest of the tyed up part, and the intermission of its proper function, the bones of the joint may be sowdred together by the interposition, and as it were glue of the defluxion which fals abundantly into the joint of the elbow, and neighbouring parts, whence the stiffness and unmoveableness thereof, as if there were a *Callus* grown there: from whence it may happen that the arm thereafter may neither be bended, nor extended, which I have observed to have happened to many. Whereof also *Galen* makes mention, and cals this kind of vitiated conformation *Ancyle* and *Ancylosis*. If a wound also associate a fracture of the arm, then see that you put about it plates of Latin, or Past-bord, and make a convenient ligature, and that the fragments of the bones be kept in the same state wherein they were set and restored. Moreover, let him lay his arm upon a soft pillow, or cushion, as the precedent figure shewes you.

Sect. 3 sect. 1. de fract.

The figure of a fractured arm, with a wound bound up, and seated, as it sit.

Com. in lib. de art.

CHAP.

CHAP. XIX. *Of the fracture of a Hand.*

THe bones of the Wrist, and After-wrist, may be broken: but, in *Hippocrates* opinion, chiefly by that kind of fracture which is called a *Sedes*; now if they shall happen to be broken, this shall be the manner of restoring them. Let the Patient lay forth his hand upon some even and smooth table, then let your servant stretch forth the broken bones, and the workmaster restore them thus extended, and put them in their proper seats. But being restored, they must be kept in their places by such remedies as are used in other fractures; to wit, cerates, compresses, linnen cloths, and splints. Now the fractured fingers shall be tyed or bound to their neighbours, that so they may the more easily, as bound to a stake, be kept in that state wherein they have been put by the hand of the Workman. But these bones, seeing they are of a rare and spongie nature, are in a short time and easily strengthened, or knit by a *Callus*. These things being done, the hollowness or palm of the hand shall be filled with a Tennis ball, for thus the broken bones shall not only be more easily kept in their places, but also the fingers themselves shall be kept in a middle posture, that is, not wholly open, nor quite shut. If they be kept in any other figure, the ensuing *Callus* will either deprave or quite aboliſh that action of the hand, whereby we take hold of any thing. The case stands otherwise with the fractured Toes; for they shall be kept streighe and even out, lest they should hinder our going or standing.

Sect. 2. de fract. sect. 9.

The cure.

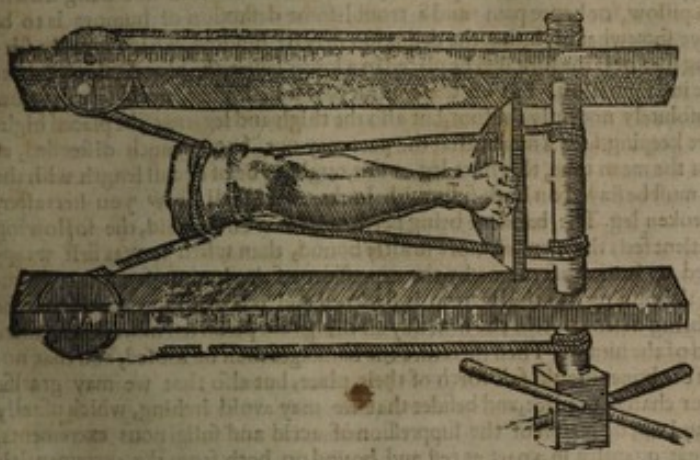
To what purpose the carrying of a ball in a fractured hand serves.

CHAP. XX. *Of the fracture of the Thigh.*

IT is a hard thing to bring the fragments of the broken thigh together to be set, by reason of the large and strong muscles of that part, which whilest they are drawn back towards their originall, by a motion both naturall and convulsive, they carry together with them the fragment of the bone, whereinto they are inserted. Therefore, when as the fracture of this bone shall be restored, the Patient must lye upon his back with his leg stretched forth, and the Surgeon must strongly and with great force extend the thigh, but if he alone shall not be able sufficiently to extend it, he shall imploy two other strong attendants, by whose joint-help the fragments may be fitted and set each against other. For this purpose, when as the strength of the hand was not sufficient, the Ancients used an Instrument, called a *Glossocomium*, whereof this is the figure.

Why the bone of the thigh is more difficultly set.

The figure of a Glossocomium, *or Extender.*



In stead of this *Glossocomium*, you may make use of my Pulley; for *Hippocrates* in this bone when it is broken, doth approve of extension so great, that although by the greatness of the extension the ends of the fragments be somewhat distant asunder, an empty space being left between; yet notwithstanding would he have ligature made. For it is not here as it is in the extensions of other bones, whereas the casting about of Ligatures keeps the muscles unmoveable: but here, in the extended thighs, the deligation is not of such force, as that it may stay and keep the bones and muscles in that state, wherein the Surgeon hath placed them. For, seeing that the muscles of the thigh are large and strong, they overcome the ligation, and are not kept under by it. The Surgeon, in setting it, shall also consider, that the thigh-bone is hollowed on the inner side, but gibbous on the outside, therefore it must be set in its native figure. Otherwise, if any, unmindfull of this consideration, would have it streight, he shall make his Patient halt all his life after: wherefore this inner and native hollowness must be filled up and preserved by putting in a compresse or boulster spread over with *unguentum rosatum*, or the like glutinous thing that it may not fall off: for thus also the ligation shall the more faithfully keep the fragments of the bone in their places. Moreover, Compresses shall be applyed to the more slender and less protuberating parts of the thigh, as those which are next the ham and knee, that so the whole ligation may be alike, and consequently the more firm. Now ligatures, as we formerly noted, are ordained for three things. The first is, that the bones may be kept in that state wherein they were set, untill they be strengthened by a *Callus*. The second is, to hinder defluxion, which easily fals into the broken and luxated parts, both by reason of pain, as also by weakness. The third is, to stay and hold fast the splints and medicins which are applyed. Inflammation is hindred by repressing and hindring the blood and other humors, ready to flow down, from entring into the part, and by pressing those humors, which are preternaturally contained in the part, into the neighbouring parts above & below. Wherefore there must no small care be had of preparing ligatures, to wit, that they be made of choice and well woven cloth, yet not course or rough; and let them be of such length and breadth, as the Surgeon, perswaded by an artificiall conjecture, shall judge to be fit for the thickness and length of the member, and greatness of the fracture: for ligatures ought to be of breadth to involve and cover all the fractured part, & a great part of that which is sound. But seeing that in my Book of Bandages, I have seemed

Sect. 67. & 68. sect. 2. de fract.

The naturall and internall crookedness must be preserved in setting the bone.

The part to be bound up, must be made plain either by nature or art.

med chiefly to set down and approve the manner of binding used by *Hippocrates*, now I thing good here in this place to describe that which is in common use amongst our Surgeons. Our Surgeons therefore at this day require three Ligatures for fractures, the first whereof they presently cast upon the hurt part, whether broken or dislocated, or only strained, making the first wrappings upon it; so that they most and straitliest bind it there, but lesse and more loosly on both sides thereof. Such circumvolutions, or wrappings, are drawn upwards, and there ended. They must be rowled thick, and not wide; for so if they presently follow, and lye one upon another, they will hold the bones more firmly, and more far and wide presse forth and represse the superfluous blood from the sound part. They presently in like sort cast the second ligature upon the very fracture, giving it two wraps, then going downwards; yet so, as that they are opener or wider, and farther distant each from other, and not so close together, as the circumvolutions of the first ligature; that so they may prels the humors the lesse to the extremities of the part, as those which cannot receive and bear, without inflammation and danger of a gangrene, such abundance of humors, for that they are not sufficiently spatious; as also more remote from the fountain of native heat, which is greater in the center than in the circumference. At the lower end of the hurt part the circumvolutions either end, or else are twined thence back again. They cast on the third ligature in that lower end of the hurt part, and rowl it smoothly and gently upwards, the windings being made contrary to the windings of the first and second ligatures; that they may so draw back into their natural state the muscles, which peradventure have been drawn aside by the force of the former wrappings. These ligations finished, they apply three splints of past-bord, or some such matter; the first below the fracture, and that truely more broad, and of sufficient length; and then two others, one on each side, distant each from other some fingers breadth, to the end to keep the bone that it do not stir to this side or that, being wrapped about with Tow or Cotton. Then they think of placing or laying the part, to which purpose they propound to themselves three scopes. The first is, that the part may lye soft; the second, smooth, or even; the third, somewhat high. The hurt part ought truely to lye soft, for that hard lying presses it, and causes pain and inflammation; which whiles the Patient cannot patiently endure, he is forced to change his place, whilst he every way seeks ease for his pain: and thus he now and then moves the fractured part, which ought to be kept quiet without any motion. It must lye smooth or even, because an unequall or uneven site distorts or draws awry the part, whilst one portion of the hurt part is born up, and sustained by that which lyes under it; but the other hanging down hath nothing thereunder, whereupon it may rest. Therefore *Hippocrates* bids us diligently to take heed that the heel do not hang down, nor the foot remain without a pillow, for hence pain and a troublesome defluxion of humors is to be feared. But the part ought to lye somewhat high, that the defluxion may be hindred, which is easily stirred up by a prone and declining site: for if the foot shal be placed in a lower figure, the blood which flowes thither from the leg, will cause inflammation. But on the contrary, if it be higher, nothing can flow down thereinto. Therefore absolutely not only the foot, but also the thigh and leg, are to be placed higher than the rest of the body: yet keeping such a mean, that the part may not be too much distended, as *Hippocrates* admonisheth us. In the mean time, this hurt leg or side, ought to be of equall length with the sound, and for that purpose it must be stayed on both sides with Junks, as we shall shew you hereafter, when we come to speak of a broken leg. The bandage being performed as we have said, the following night, and the next day the Patient feels the member more straitly bound, than when it was first wrapped; yea, verily the knee is lifted up into a soft tumor by the expression of the humor from the wounded part: but on the contrary, the ensuing day the ligation is slackned and relaxed, some portion of the humor contained in the part being digested. Also the next day all things are perceived more loose, there being made a larger resolution of the humor. Then therefore the bandages must be loosed, and that not only, lest that the fragments of the bones should fall forth of their place, but also that we may gratifie the Patient by that alteration or change of place, and besides that we may avoid itching, which usually happens to parts too long bound up, by reason of the suppression of acrid and fuliginous excrements, which use to be gathered in great quantity in a part at rest and bound up, both from the excrementitious humors, wherewith the part is moistened, and the alimentary humors, in a part which is idle and at quiet; by reason the diffilation and transpiration are hindred by want of exercise, and the pores of the skin shut up by the abundance of the ligatures: so that by the suppression thereof, many have not only an itching, but also the skin being broke by the acrimony of these, as well vapours as humors, which are kept shut and pent up, have ulcers break forth. Therefore when such accidents shall be feared, the part shall so long be fomented with warm water and oil, as you shall think fit: for, such fomenting asswageth pain, relaxeth that which was too much straitned by the binding, and amends the refrigeration of the part, caused by the repercussion and expression of the blood and spirits, the native and internall heat being by this means revived. If, together with the tumor, there be a contusion and sugillation, it must be the longer fomented, that the excrementitious humor residing in the part may be digested. But if this quantity of time shall not suffice, then must you use stronger digestives: yet have a care you use them not too long; for so you should hinder the generation of a *Callus*. Therefore that saying of *Hippocrates* must here be remembred, which saith, That a weak fomentation, and the short time of using one doth attract, but not discusse; but a longer and stronger wasts the flesh. Besides also, you must have regard to the temper and habit of the Patient; for fomentations, used to plethorick bodies, draw superfluous humors to the part. The Ancients bid, that the ligatures be loosed every third day untill their seventh days; but after the seventh, on every seventh day: but hereof nothing can be certainly and perpetually decreed For, according to the accidents the patients must be dressed sooner or later, more often or seldome; renuing the ligatures, and the rest of the dressing. Therefore, if no symptome urge, I would have none of these things, which are done to the Patient at the first dressing, to be moved, unlesse as slowly and seldome as you may. For you hinder the knitting of the bone, if you never so little move the ends of the fragments thereof: for,

The manner of binding used by Surgeons at this day.

Why the windings of the upper ligatures must be thicker and straiter than the lower.

Why the third ligature must be rowled contrary to the two first.

The Surgeon must be mindfull of three things in placing the member.

Sect. 2. de fract.

Sent. 33. & 56. sect. 2. de fract.

When the first ligation must be loosed.

Sent. 15. sect. 3 de offic.

for, as you see wood is joined together by glue, and pewter with sowder; so the fragments of bones are, by a providence of nature, glued and sowdred together by a *Callus*. Wherefore broken bones have very much need of rest, to the generating of a *Callus*; otherwise, the matter thereof flowing down, quickly flowes away, and nothing is done. You may much help forwards the generation of a *Callus*, which is begun about the thirteenth or fifteenth day, by applying an emplaister made with the white of an egg, having the powder of red rose leaves, and wheat flour mixed therewith, and other catagmatick plaisters, which shall hereafter be described in speaking of the fracture of a leg. Rest necessary for the knitting of fet bones.

CHAP. XXI. *Of the fracture of the Thigh nigh to the joint, or the upper or lower head of the bone.*

A Fracture sometimes happens at the joint of the hip in the neck of the thigh bone, as I once observed in an honest matron. I being called to her, when I had observed the hurt thigh to be shorter than the whole, with the outward prominency of the *Ischium*, which at the first sight I supposed to proceed from the head of the thigh bone, I presently perswaded my self it was a dislocation and no fracture; I then therefore extended the bone, and forced (as I thought) the head thereof into its cavity. The equality of both the legs in bigness which followed upon this extension, encreased my perswasion that it was a dislocation. The next day I visited her the second time, and found her in great pain, her hurt leg the shorter, and her foot wrested inwards. Then I loosed all her ligatures, and perceived such a prominency as I did formerly. Wherefore I endeavoured again to force in the head of the bone, as I formerly did. But as I was busied therein, I heard a little crackling, and also I considered, that there was no cavity nor depression in the joint, by which signs I certainly perswaded my self, that the bone was broken; and not dislocated. Neither only such kind of fractures, but also the separation of the *appendix* or head of this bone from its place, may induce one to think it a dislocation; which thing hath sometimes deceived some heedless Surgeons, who have not dreamt of the divulsion or separation of the *appendix* from the top of the thigh bone, but have judged it only a dislocation. Then therefore (that I may return to my former narration) I set the bone, and joined the fragments together, laid thereupon splints with compresses, made ligations with a rowler, having two heads wrapped about the joint, and the body cross-wise, and I defended her foot with a case, that none of the cloths might press it. I fastned a rope to a post, and so let it come down into the midst of the bed, and tyed many knots thereon, for the better taking hold and lifting up her self; the which thing you must alwayes do in fractures and dislocations of the thigh and leg, that so your Patients may have some stay, whereby they may succour themselves with their hands, as oft as they desire to rise, or lift themselves up in their beds, or go to stool; as also, that they may give perspiration, and as it were ventilation to the loins, buttocks, rump, and other parts, compressed and wearied with long lying, for want whereof they are molested with heat and pain, whence ulcers arise, which oft-times torment the Patient with such tormenting heat and pain, that he is even consumed by a feaver, watchings, and want of rest. This opportunity of raising the body out of the bed, is by so much the more needfull in this place, by how much the fracture is nearer the joint; for there it is more dangerous than in the midst of the thigh, and consequently more difficult to dress and heal, for that the part is bloodless, and by reason of the multitude of the nerves, tendons and ligaments, which are obnoxious to many malign symptomes. But the Surgeon must have diligent care in this kind of fracture, and must look often that the bone, which is set, do not fall forth again, which easily happens here by any light stirring of the body, and the like occasion, for that the thigh hath but one only bone. Therefore, as oft as the Bandages shall be loosed, and the fracture dressed, he shall attentively view the figure of the bone, and the magnitude of the affected part, comparing it with the sound; for the set and composed fragments of the broken bone, can scarce fall asunder, but that the one must lye upon the other. But before it be knit, the part must be extended and restored to its state, that so the Patient may not halt during the residue of his life. For I have read it written in *Avicen*, that scarce any do so well recover a fractured thigh, that they do not halt thereof; therefore the Patient must be carefull, that he move himself, or his body as little as he can. Many of the Ancients have set downe the time of the consolidation of this bone to be fifty dayes: but (as I formerly said) there can be no certain or determinate time hereof. But in what time soever this bone shall be knit, the Patient must not stand or go thereon presently upon it; for that there remains a weakness in the part a long time after, so that the Patients are forced to use crutches to go withall, in the mean space while they recover more strength.

A History.

Another fracture of the thigh, resembling a luxation.

Why the fracture of a bone near a joint is more dangerous.

Lib. 3. fen. 6. tract. 1. c. 14.

In what space the thigh bone may be knit.

CHAP. XXII. *Of the fracture of the* Patella, *or whirle bone of the knee.*

THe whirle bone of the knee is oft-times contused, but not so frequently broken; yet when that happens, it goes into two or three pieces, sometimes long-wise, sometimes athwart. Sometimes it is broken in the midst, and sometimes shivered into many splinters, and all these either with, or without a wound. The signs are, impotency in going, a hollowness in that place, and a sensible separation of the fragments of the hurt part, and the crackling of these parts under your hand. It is set after this manner; wish the Patient to stretch forth his leg, yea, he must keep it extended all the while, untill it be knit; and therefore lest he should bend it unawares, the hollowness of the ham shall be filled with a boulster; for by bending of the knee, the set fragments of the whirle bone would again fly in sunder. This being done, the fragments shall by the hand of the Surgeon be set as is fitting, and be kept so set by the application of convenient remedies, making ligatures, and applying junks, as we said must be done in the fracture of the thigh bone. And lastly, you must observe and do in this as in the fracture of a leg. For the prognostick this I affirm, that I have seen none of those who have had this bone fractured, who have not halted during the rest of their lives. The cause hereof is, the knit-

The Differences.

Signs.

Cure.

Why those halt who have had this bone fractured.

ting by the concretion of a *Callus* hinders the free bending of the knee; going, especially on even ground, is more easie to the Patient, but an ascent is far more difficult, and absolutely painfull. The Patient must necessarily for this kinde of fracture lye or keep his bed, at the least for forty dayes.

CHAP. XXIII. *Of a broken leg.*

Sect. 65. sect. 2. de fract.

THis kind of fracture is cured after the same manner as that of the arm or cubit. *Hippocrates* admonisheth us, that the *Tibia*, or leg bone is more dangerous to be broken, and more difficult and slow to be healed than the *Fibula*, or shin bone; because that is the thicker, and as it were the upholder of the whole bulke of the body; but this other is but as it were a certain additament or assistant, provided for the staying or bearing up of the muscles of the leg, by which the foot is moved. The leg bone being only broken, the signs thereof are perceived only in the inner part of the leg; for that the shin bone being whole, suffers it not to throw or cast forth it selfe. On the contrary, when the shin bone only is broken, the signs thereof appear only in the externall part of the leg; because the leg bone, being opposed thereto, doth not suffer it to cast in its self, and with its fragments to turn inwards. But when both the bones are broken, the signs of the fracture may equally appear both here and there. But when only one of these bones are broken, the fracture is far more easie to dresse and heal, because that which remains whole, is a much more firm stay to that which is hurt, than any splints can be. But that I may the better instruct and make ready the Surgeon for the restoring of this fracture, I will illustrate the matter by an example from my self. *John Nestor*, Doctor of Physick, *Richard Hubert*, and I, went together to visit a Patient at the place of the Frier Minorites. Wherefore intending to pass over the Sein within sight of the place, I endeavoured to make my horse take boat, and therefore switched him over the buttocks. The Jade, madded herewith, so struck at me with his heels, that he brake both the bones of my left leg, some four fingers breadth above my ancle. Then I, fearing some worse mischief, and lest the Jade should double his blow, flew back; and as I fled back, the broken bones flew in sunder; and breaking through the flesh, stocking, and boot, shewed themselves, whereby I felt as much pain, as it is credible a man was able to endure. Wherefore I was presently carried into the boat, that so I might be carryed to the other side of the water to be dressed; but the stirring of the boat as they rowed, almost killed me with bitternesse of pain, for that the sharp fragments of the bones were rubbed against the flesh which lay next them. Being ferried over, as I was conveyed into the next houses, my pain was much increased, whilest lifted by the hands of divers persons, one while up, another down, sometimes to the left side, other whiles to the right with my whole body, and all the parts thereof. When at the length I was laid upon a bed, I was somewhat freed from the bitternesse of my pain, and had time to wipe off the sweat, which ran down over all my body. Then was I dressed with such a medicine, as the time and place would afford, we composed it of the white of an egge, wheat flour, soot of a chimny, and melted butter. For the rest, I entreated *Richard Hubert*, that he would handle me, as if he knew me not, neither that, moved for love of me, he should remit any thing of the severity of art, but chiefly, that he would stretch my foot straight out, and if the wound were not sufficiently wide, that he would enlarge it with his incision knife, that so he might the more easily set the broken bones in their due places; that he would with his fingers (whose judgment is far more certain than the best made instruments) search, whether the splinters which were in the wound were quite severed from the bone, and therefore to be taken forth; that he would with his hand presse forth the blood, and the clods of blood which were in a great quantity concrete at the mouth of the wound; that he would bind up and place my leg in that site and manner, as he thought best: which is, that he should have three rowlers in a readinesse, the first whereof he should cast directly upon the wound, so that he should begin his ligation at the wound: also he should put splints about it; some three, but others two fingers bredth, of the length of half a foot, somewhat depressed and hollowed, whereby they might be the more easily put about the leg, more straitly at their ends, and a fingers distance each from other, which at the last he should bind with fillets, like those wherewith women use to bind up their hair; yet so that the binding might be more strait upon the wound: and that he would fill the cavity of the ham, and of the ancles with boulsters made of flaxe wrapped in linnen clothes: that he would fortifie the sides of my leg with Junks made of bents or little sticks, and lined with linnen cloth, stretched from my heel to my groin, and bound over in four places; so that the strait figure of the leg might scarcely be perverted by any force: that he would gently, and smoothly, lift up my leg to an indifferent height: and lastly, that he should arm it from the violence of externall injuries, by putting it in a box or case. But you must note, that the fit placing or laying of the leg is a matter of such moment, that if any error be here committed, it will cause no lesse than lamenesse. For if it be lifted up higher than is fit, the *Callus* will be hollow on the forside; if lower, then it will be gibbous or bunching forth. Neither also do they commit a small error, who do not fill up the cavities at the ancles after the aforementioned manner: for, hereupon the heel will be much afflicted, whilest it is forced to sustain a tedious and painfull compression, which at length brings a hot distemper, because the spirits cannot freely flow thereto; which I finding by experience, not knowing the cause, willed them ever now and then to lift up my heel, whereby it might enjoy the benefit of perspiration, and the spirits have free entrance thereinto, and

Signs that both the bones are broken.

A History.

A soone made medicine.

What to do when the leg is broken.

The figure of a Leg fractured with a wound, and bound up.

and the contained vapours passing forth. To conclude, my hurt leg was laid upon a cushion after the manner you see described in the page precedent.

CHAP. XXIV. *Of some things to be observed in ligation, when a fracture is associated with a wound.*

THis, taken out of the doctrine of the Ancients, ought to be kept firm and ratified, that ligation must be made upon the wound; otherwise the wounded part will presently lift it self up into a great tumor, receiving the humors pressed thither by the force of the ligation made on this & that side, above and below, whence ensue many malign symptoms. You may make tryall hereof upon a sound fleshy part; for if you bind it above and below, not touching that which is in the midst, it will be lifted up into a great tumor, and change the flourishing and native colour, into a livid or blackish hue, by reason of the flowing and abundance of the humors pressed forth on every side from the neighbouring parts. Therefore such things will happen much the rather in a wounded or ulcerated part. But for this cause, the ulcer will remain unsuppurated and weeping, crude and liquid *sanies* flowing there-hence, like unto that which usually flowes from inflamed eyes. Such *sanies*, if it fall upon the bones, and make any stay there, it, with the touch thereof, burns and corrupts them, and so much the more, if they be rare and soft. These will be the signs of such corruption of the bones; if a greater quantity, and that more filthy *sanies*, flow from the ulcer, than was accustomed, or the nature of a simple ulcer requires; if the lips of the ulcer be inverted; if the flesh be more soft and flaccid about them; if a sorrowfull sense of a beating, and also deep pain torment the Patient by fits; if, by searching with your probe, you perceive the bone to be spoiled of its *periosteum*; and lastly, if you find it scaly and rough; or also if your probe be put down somewhat hard, it run into the substance of the bone. But we have treated sufficiently hereof in our particular Treatise of the rottenness of the bones. But certainly such rottenness will never happen to the bone, if the hurt part be bound up, as is fit, and according to art. Wherefore I judge it not amiss, again to admonish the Surgeon of this, that as far as the thing shall suffer, he make his rowlings upon the wound; unless by chance there be such excessive pain and great inflammation, that, through occasion of such symptomes and accidents, he be diverted from this proper and legitimate cure of the disease. Therefore then, because nothing more can be done, let him only do this, which may be done without offence; that is, let him supply the defect of ligation and rowlers, with a linnen cloth, not too weak, nor too much worn, being twice or thrice doubled, and which may serve to compass the wound and neighbouring parts once about: let him sew the edges thereof at the sides of the wound, lest he be forced to stir the fragments of the bones (which once set ought to be kept unmoved) as often as the wound comes to be dressed. For, broken bones do not require such frequent dressing, as wounds and ulcers do. By this it appears, that as want of binding, and too much loosness in absence of pain and a phlegmon, so also too strait ligation, when pain is present, brings a phlegmon and abscess to the wound. Therefore let all things here, according to the forementioned rules and circumstances, be indifferent. I have for this purpose thought good to reiterate these things, because you shall as yet find many, who follow the practise of *Paulus*, and make many circumvolutions here and there, above and below the wound, which presently they carry cross-wise. But this cross or lattice-like kind of ligation is wholly to be disliked, and that only to be used which we have described, according to the mind of *Hippocrates*. Now it is time that I returne to the former history of my mishap, and declare what was done to me after that first dressing, which I have formerly mentioned.

That ligation must be most strait upon the wound.

What symptomes ensue the want of binding upon the wounded part.

Signs of the corruption of the bones.

When the wounded part must be omitted in ligation.

Lattice-like binding to be shunned.

CHAP. XXV. *What was used to the Authors leg after the first dressing.*

BEing brought home to mine own house in *Paris* in the afternoone, they took from me, out of the Basilica of the left arm, some six ounces of blood. And then at the second dressing the lips or edges of the wound and places thereabout were annointed with *unguentum rosatum*, which by a joint consent of the Ancients, is much commended in the beginnings of fractures: for it will affwage pain, and hinder inflammation, by repelling the humors far from the wounded part: for it is cold, astringent and repelling, as the composition thereof shewes; for it is made *ex oleo omphacino, aqua rosacea, pauco aceto, & cera alba*. Therefore I used this ointment for six dayes; I dipped the compresses and rowlers somewhiles in oxycrate, otherwhiles in thick and astringent red wine, for the strengthening of the part, and repressing the humors; which two things we must have a care of in *Hippocrates* opinion, in fractures especially with a wound. Wherefore if at any time the compresses or rowlers seemed to dry, I now and then moistned them with the oxycrate, or rose vineger: for, by their too much drinesse, pain and inflammation happen; and if they bind the part somewhat more strait, they hurt it also by their hardness. You shall see many Surgeons, who in this kind of affect, from the beginning to the end, use only astringent and emplastick medicins, wholly contrary to the method set down by *Hippocrates*, and commended by *Galen*. For, by the continued use of such things, the pores, and breathing places of the skin are shut up; whence the fuliginous excrement being suppresst, the externall heat is increased, and itching caused, and at length an ulcer by the fretting of the acrid and serous humour long suppresst. Whereby you may learn, that astringent and emplastick medicins must not be used above six dayes. In stead hereof you shall use the emplaisters, which I shall presently describe. In the beginning of my disease I used so spare a diet, that for nine dayes I ate nothing each day, but twelve stewed prunes, and six morsels of bread, and dranke a *Paris* pint of fugred water, of which water this was the composition. R. *succ. albif.* ℥xij. *aquæ font.* ℔xlj. *cinam.* ʒiij. *bullant simul secundum artem*: Otherwhiles I used syrup of maidens-hair with boiled water: Otherwhiles, the divine drink (as they term it) whereof this is the composition. R. *aquæ cotle* ℔vj. *succ. albif.* ℥iv. *succ. lim.* ℥j. *agitentur & transvasentur sæpius in vasis vitreis*. I was purged when need required with

Unguentum rosatum, wherefore good in fractures.

You must have a care, that the compresses and rowlers grow not hard by drinesse.

The description of a fugred water.

with a bole of *Caſſia* with Rubarb. I uſed alſo ſuppoſitories of Caſtle ſoap to make me go to ſtoole; for, if at any time I wanted due evacuation, a preternaturall heat preſently ſeiſed upon my kidnies. With this, though exquiſite manner of diet, I could not prevail, but that a fever took me upon the eleventh day of my diſeaſe, and a defluxion, which turned into an abſceſs, long flowing with much matter. I think the occaſion hereof was ſome portion of the humor ſuppreſt in the bottome of the wound; as alſo by too looſe binding, by reaſon that I could not endure juſt or more ſtrait binding; and laſtly, ſcales or ſhivers of bones quite broke off, and therefore unapt to be agglutinated: for theſe therefore putrefying, drew by conſent the proper nouriſhment of the part into putrefaction, and by the putredinous heat thence ariſing, did plentifully adminiſter the materiall and efficient cauſe to the defluxion and inflammation. I was moved to think they were ſcales ſevered from their bone, by the thin and crude *ſanies* flowing from the wound, the much ſwoln ſides of the wound, and the more looſe and ſpongy fleſh thereabouts. To theſe cauſes, this alſo did accrew, one night amongſt the reſt, as I ſlept, the muſcles ſo contracted themſelves by a violent motion, that they drew my whole leg upwards; ſo that the bones, by the vehemency of the convulſion, were diſplaced, & preſſed the ſides of the wound; neither could they be perfectly compoſed or ſet, unleſs by a new extenſion and impulſion, which was much more painfull to me than the former. My feaver when it had laſted with me ſeven dayes, at length enjoyed a *criſis* and end, partly by the eruption of matter, and partly by ſweat, flowing from me in a plenteous manner.

The cauſes of a fever and abſceſs, enſuing upon a fracture.

Signs of ſcales ſevered from their bones.

CHAP. XXVI. *What may be the cauſe of the convulſive twitching of broken members.*

THis contraction, and (as it were) convulſive twitching, uſually happens to fractured members in the time of ſleep. I think the cauſe thereof is, for that the native heat withdraws its ſelf while we ſleep, into the center of the body; whereby it commeth to paſs, that the extream parts grow cold. In the mean while, nature, by its accuſtomed providence, ſends ſpirits to the ſupply of the hurt part. But becauſe they are not received of the part evill affected and unapt thereto, they betake themſelves together, and ſuddenly, according to their wonted celerity, thither from whence they came, the muſcles follow their motion: with the muſcles, the bones, whereinto they are inſerted, are together drawn; whereby it comes to paſs, that they are againe diſplaced, and with great torment of pain, fall from their former ſeat. This contraction of the muſcles is towards their originall.

Why the extream parts are cold when we ſleep.

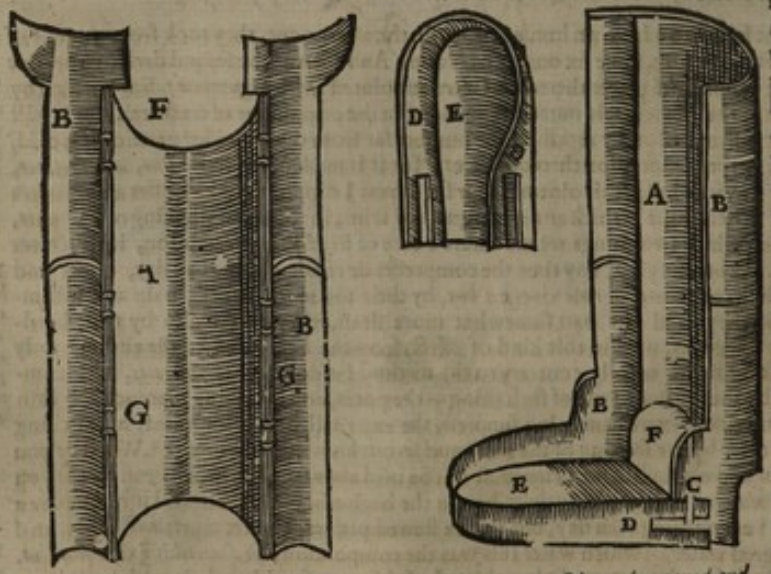
CHAP. XXVII. *Certain documents concerning the parts, whereon the Patient muſt neceſſarily reſt, whileſt he lyes in his bed.*

THoſe who have their leg or the like bone broken, becauſe they are hindered by the bitterneſs of pain, and alſo wiſh for their cure or conſolidation, are forced to keep themſelves without ſtirring, and upon their backs in their beds for a long time together. In the mean ſpace, the parts whereupon they muſt neceſſarily lye, as the heel, back, holy-bone, rump, the muſcles of the broken thigh or leg, remain ſtretched forth and unmovable, ſet at liberty from their uſual functions. Whereby it comes to paſs, that all their ſtrength decaies, and grows dull by little and little. Moreover alſo, by the ſuppreſſion of the ſuliginous and acrid excrements, and want of perſpiration, they grow preternaturally hot; whence defluxion, an abſceſs and ulcer, happen to them, but principally to the holy bone, the rump, and heel: to the former, for that they are defended with ſmall ſtore of fleſh; to the latter, for that it is of more exquiſite ſenſe. Now the ulcers of theſe parts are difficulty healed, yea, and oft-times they cauſe a gangrene in the fleſh, and a rottenneſs and mortification in the bones there-under, and for the moſt part a continued feaver, *delirium*, convulſion, and (by that ſympathy which generally accompanies ſuch affects) a hicketing. For the heel and ſtomach are two very nervous parts, the latter in the whole body thereof, and by a large portion of the nerves of the ſixth conjugation; but the other by the great tendon paſſing under it, the which is produced by the meeting, and as it were growing together of the three muſcles of the calf of the leg. All which are deadly, both by diſſipation of the native heat by the feaveriſh, and that which is preternaturall; as alſo by the infection of the noble

The naturall faculties languiſh in the parts by idleneſs, but are ſtrengthened by action.

How and what ulcers happen upon the fracture of the leg, to the rump and heel.

The figure of a Caſſe.



AA. *Shew the bottome or belly of the Caſſe.* BB. *The wings or ſides to be opened and ſhut at pleaſure.* C. *The end of the wings, whereto the ſole or arch is fitted.* DD. *The Arch.* EE. *The ſole.* FF. *An open ſpace, whereat the heel hangs forth of the Caſſe.*

noble parts, whose use the life cannot want, by carrion-like vapours. When as I considered all these things with my self, and (become more skilfull by the example of others) understood how dangerous they were, I wished them now and then to lift my heel up out of the bed; and taking hold of the rope which hung over my head, I heaved up my self, that so the parts, pressed with continuall lying, might transpire, and be ventilated. Moreover also I rested these parts upon a round cushion, being open in the middle, and stuffed with soft feathers, and laid under my rump and heel; that they might be refreshed by the benefit and gentle breathing of the air: and I did oft-times apply linnen clothes spred over with *unguentum rosatum*, for the asswaging of the pain and heat. Besides also, I devised a Casse of Lattin, wherein the broken leg being laid, is kept in its place, far more surely and certainly than by any junks; and moreover also, it may all be moved to and again at the Patients pleasure. This Cass will also hinder the heel from lying with all its body and weight upon the bed, putting a soft and thick boulster under the calf, in that place where the Cass is hollow: besides also, it arms and defends it against the falling down and weight of the bed clothes, having a little arch made over and above of the same matter. All which shall be made manifest unto you by the precedent figure. Now it remains, that I tell you what remedies I applyed to the abscess which happened upon my wound. When therefore I perceived an abscess to breed, I composed a suppurative medicin of the yolks of egs, common oil, turpentine, and a little wheat flour, and I used it untill it was opened; then to cleanse it I used this following remedy. R. *syrupi rosati & terebinth. venetæ, an.* ℥ij. *pulveris radicis iridis florentiæ, aloes, mastiches, farinæ hordei, an.* ℥ß. *incorporentur omnia simul & fiat mundificativum:* but I had a care, that the place, whereat I conjectured the quite severed scales of the bones must break forth, should be filled with tents made of sponge or flax, that so, by this means, I might keep the ulcer open at my pleasure. But I put into the bottome of the ulcer catagmatick and cephalick powders, with a little burnt alum, to procure the egress of the formerly mentioned scales. These at length cast forth, I cicatrized the ulcer with burnt alum. For, this having a drying and astringent faculty, confirms and hardens the flesh, which is loose and spongy, and flowing with liquid *sanies*, and helps forward natures endeavor in cicatrization. For, the fragments of the bones, they, by reason of their naturall driness and hardness, cannot be joined and knit together by themselves without a *medium*: but they need a certain substance, which, thickning and concreting at their ends, doth at length glue them together, and (as it were) fasten them with soder. This substance hath its matter of the proper substance and marrow of the bones; but the former from the native heat, and emplastick medicins, which moderately heat. For, on the contrary, these medicins, which, by their too much heat, do discuss and attenuate, do (as it were) melt and dissolve the matter of the *Callus*, and so hinder the knitting. Wherefore for this purpose, I would wish you to make use of the following emplasters, of whose efficacy I have had experience; for, hence they are called knitting or consolidating plaisters. R. *olei myrtill. & rosarum emphac. an.* lb. ß. *rad. althææ* lb. ij. *rad. fraxini, & fol. ejusdem, rad. consolidæ majoris & fol. ejusdem fol. salicis, an.* m. j. *fiat decoctio in sufficienti quantitate vini nigri, & aquæ fabrarum, ad medietatis consumptionem, adde in colatura pulveris myrrhæ & thuris an.* ℥ß. *adipis hirci,* lb. ß. *terebinth. lotæ* ℥iv. *masticches* ℥iij. *litharg yri auri & argenti, an.* ℥ij. *boli armeniæ, & terræ sigillatæ, an.* ℥j. ß. *minii* ℥vj. *ceræ albæ quantum sufficit: fiat emplastrum, ut artis est.* In stead hereof you may use the black emplaister, whereof this is the description. R. *litharg yri auri* lb. j. *olei & aceti* lb. ij *coquantur simul lento igne donec nigrum & splendens reddatur emplastrum, & non adhæreat digitis.* Or else, R. *olei rosat. & myrtill. an.* ℥ij. *unc. cupressi, boli armen. sanguinis drac. pulverisatorum an.* ℥. ß. *emplastri diachalcitheos* ℥iv. *liquefaciant simul, & fiat emplastrum secundum artem.* In defect of these, you may use a Cere-cloth, or *tela Gualteri*, whereof this is the description. R. *pulveris thuris, farinæ volatilis, masticches, bolarm. resinæ pini, unc. un. cupressi, rubiæ tinctorum, an.* ℥ij. *sevi arietini & ceræ albæ an.* lb. ß. *fiat emplastrum:* into which (whilest it is hot) dip a warm linnen cloth, for the forementioned use. *Emplastrum Diacalcitheos*, by the common consent of all the Ancients, is much commended for fractures; but it must undergo different preparations, according to the condition of the time; for in the summer it must be dissolved in the juice of plantain and night-shade, lest it should heat more than is fit. It is convenient, in the *interim*, to have regard to the temper of the affected bodies; for neither are the bodies of children to be so much dried as these of old men: otherwise if such drying medicins should be applyed to young bodies as to old, the matter of the *Callus* would be dissolved, it would be so far from concreting; wherefore the Surgeon must take great heed in the choice of his medicins. For, oftentimes remedies, good of themselves, are by use made not good, because they are used and applyed without judgement: which is the cause that oft-times pernicious accidents happen, or else the *Callus* becomes more soft, hard, slender, crooked, or lastly, concretes more slowly by the great error, and to the great shame of the Surgeon.

Remedies for the prevention of the foresaid ulcers.

The use of a Lattin Casse.

A suppurative medicine.

A deterfive.

Catagmatick powders have power to cast forth the scales of bones.

The causes both efficient and materiall of a *Callus*.

Medicins conducing to the generation of a *Callus*.

The black plaister.

The Description of a *Sparadrapum*, or Cere-cloth.

Medicins good of themselves, not good by event.

CHAP. XXVIII. *By what means we may know the Callus is a breeding.*

THen I knew that my leg begun to knit, when as less matter than was usuall came from the ulcer, when the pain slackened, and lastly, when as the convulsive twitchings ceased; which caused me to judge it fit to dress it seldomer than I was used to do. For, by the frequent detersion in dressing an ulcer, whilest a *Callus* is breeding, the matters whereof it is to be made, are drawn away and spent, which are (as they term them) *Ros*, *Cambium*, and *Gluten*, which are the proper and genuine nourishments both of the bony, as also of the fleshy substance. I by other signs also conjectured the breeding of the *Callus*, to wit, by the sweating of a certain dewie blood out of the edges and pores of the wound, which gently dyed and bedewed the boulsters and ligatures, proceeding from the efflux of the subtler and gentler portion of that matter, which plenteously flowed down for the breeding of a *Callus*. As also, by a tickling and pleasing sense of a certain vapour, continually creeping, with a moderate and gentle heat, from the upper parts even to the place of the wound. Wherefore thence forwards I somewhat loosened the ligation, lest, by keeping it too strait, I should hinder from entring

When the *Callus* is breeding the ulcer must be seldome dresst.

Hipp. Sent. 43. *sect.* 1. *de fract.*

entring to the fragments of the bones, the matter of the *Callus*, which is a portion of the blood, temperate in quality, and moderate in quantity. Then therefore I thought good, to use nourishments fit to generate more gross, thick and tenacious blood, and sufficient for generating a *Callus*; such as are the extremities, tendinous, and gristly parts of beasts, as the heads, feet, legs, and ears of Hogs, Oxen, Sheep, Kids; all which I boiled with rice, French barley, and the like, using somewhiles one, somewhiles another, to please my stomach and palate. I also sometimes fed upon frumity, or wheat sodden in Capon broth with the yolks of egs; I drank red, thick and astringent wine, indifferently tempered with water. For my second course, I ate chesnuts and medlars: neither do I without some reason, thus particularize my diet: for that gross nourishments, especially if they be friable and fragil; as beef is, are alike hurtfull (for as much as pertains to the generating of a *Callus*) as light meats are For that makes the *Callus* too dry, these too tender. Wherefore *Galen* pronounces these meats only fit for generating a *Callus*, which are neither fragil, nor friable, neither serous and thin, nor too dry; but indifferent gross, and also viscid, fat and tough. These meats, digested by the stomach into *chylus*, are sent into the guts, and from hence, by the mesaraick veins, into the gate-vein, and the hollow part of the Liver, thence into the hollow vein, and so into the veins dispersed over all the body and the parts thereof. There are also some of these veins which carry blood into the bones; but in the large cavities of the bones is marrow contained, as in the small a certain marrowy substance, proportionable thereto, being their proper nourishment. The generation of marrow is from the grosser portion of the blood; which flowes into the greater cavities of the bones by larger veins and arteries, but into the less by lesser, which end in their pores and small passages. For, in large bones you may observe large and apparent passages, by which the veins and arteries enter for the forementioned use. By the same wayes the nerves also insinuate themselves, from whence proceeds a membrane which involves the marrow of the bones, the which by that means is endued with most exquisite sense, as experience teacheth; which is the cause that makes many beleeve, that the marrow hath sense of feeling, because the membranes thereof being hurt cause most bitter pain. Therefore out of the marrow and the proper substance of the bone, there sweats a certain gross and terrestriall juice, whereof, by the power of the assimilating faculty, which serves in stead of the formative, a *Callus* growes and knits. Simple fractures of the leg are usually knit in fifty daies, but through the occasion of the wound and the scales quite broke off, and other accidents which befell me, it was three whole months before the fragments of the bones were perfectly knit, and it was also another month, before I could go upon my leg without the help of a crutch. Going was painfull to me for some few dayes, because the *Callus* had taken up some place of the muscles: for, before my former freedome of motion could return again to the broken and knit part, it was necessary, that the tendons and membranes should separate themselves by little and little from the scar. In the performance of all these things, I had the diligent and faithfull assistance amongst the Surgeons, to omit Physitians, of *Anthony Portal* the Kings Surgeon.

Meats fit for generating a *Callus*

Lib. 6. meth. cap. 5.

Why the marrow may seem to have sense of feeling.

In what space the leg is usually knit.

CHAP. XXIX. *Of those things which may hinder the generation of a* Callus, *and how to correct the faults thereof, if it be ill formed.*

HAving already spoken of the signs of a *Callus* beginning to concrete, of its generation and the manner thereof: it now remains, that we treat of those things which hinder the generation thereof; and what on the contrary help forwards the conformation and concretion thereof. Now these things which either wholly hinder, or else retard the generation of a *Callus*, have a strong and powerfull discussive and attenuating faculty; or else they are unctuous, oily, and moist. For by such, the juice, whereof the *Callus* ought to be, is either melted and consumed, or else growes soft, and is relaxed. But on the contrary, those things which help forwards a *Callus* must be drying, incrassating, thickening, hardning, and emplastick, moderately hot and astringent. But for moist and relaxing medicins, they ought to have no place here, unless when it happens that the *Callus* is ill formed, that is, too thick, or crooked, or otherwise ill shapen, whereby it may be wasted and broken, so to be restored again after a better manner. Yet notwithstanding, such things are not to be attempted, unless when the *Callus* is yet green, and so depraved, that the fault thereof doth very much pervert the native conformation of the part, and exceedingly offend the action. Then therefore in such a case, the place must be fomented with a decoction of a Sheeps head and guts, wherein shall be boiled the roots of Marshmallowes, of Briony, the seeds of Line, of Fænugreek, Pigeons dung, Bayberries, and the like. You shal also use this following ointment and plaister. ℞ *unguenti de Althæa* ℥iv. *olei liliorum, & axungiæ anseris an.* ℥i. *aquæ vitæ parum, liquefiant simul, fiat linimentum quo liniatur pars.* Then apply this following emplaister. ℞ *emplast. de Vigo cum mercurio, cerati æspati descriptione Phylagrii, an.* ℥iij. *olei anethini & liliorum an.* ℥j. *liquefiant omnia simul, fiat emplastrum*; let it be spred upon leather for the aforesaid use. When by this means the *Callus* shall seem to be sufficiently mollified, it shall be broken, and the bones restored to their naturall state, and the cure of the fracture to be followed as at the beginning. If the *Callus* be become too hard through age, it is better not to break it, but to let it alone, lest some worse accident befall the Patient. For it may so fall out, that by your labouring to break it, the bone may break in some other part, before it break in that which is knit by the *Callus*. Therefore the discreet Patient had rather live lame, than for eschewing it, to undergo the hazzard of his life. If the *Callus* be too gross, it shall be diminished (if it be as yet fresh) with emollient, resolving, and powerfully astringent medicins, which have force to dissolve, dry and exhaust. It will also be good strongly to rub the *Callus* with oil of Bayes, wherein Salt-petre, or some other kind of Salt hath been dissolved, then wrapped about with a rowler to bind it very straitly, putting a leaden plate thereon, whereby the flowing down of the nourishing humor into the part, may be forbidden; that thus by little and little the *Callus* may decay and diminish. If on the contrary, it any wayes happen that the *Callus* be more thin and slender, and grows more slowly, for that it is too straitly bound,

Discussing and unctuous medicins hinder the generation of a *Callus*.

What helps forward the generation thereof.

What *Callus* must not be broken, though distort, or otherwise ill conformed.

The causes of too slender a *Callus*

bound, or becauſe the idle part is longer kept in quiet than is fit, without exerciſing of its proper function, (which cauſe is to be reckoned amongſt the chief cauſes of the leanneſs, even for this reaſon, for that exerciſe ſtirs up the native heat of the part, the worker of digeſtion and nutrition) or elſe for that they feed upon ſuch nouriſhments as offend in quality, or quantity, or both, or for that the ligature, uſed to the part, is too often looſed, or becauſe the part its ſelf is too haſtily and before the time put to undergo ſolid offices and motions. According to the variety of cauſes, medicins ſhall be applyed. For if the ligature of the part be too ſtrait, it ſhall be looſed, yea verily the fractured place, the ligature being taken away, ſhall be quite freed from ligation, and a new kind of ligature muſt be made, which muſt be rowled down from the root of the veſſels, that is, from the armpits, if the arm; or from the groin, if the leg be broken, to the fracture; yet ſo, as that you may leave it untouched or taken in, for thus the bloud is preſſed from the fountain and ſpring, and forced into the affected part, by a way quite contrary to that, whereby we have formerly taught, in fear of inflammation, to hinder it from entrance into the affected part. Alſo gentle frictions and fomentations with warm water may be profitably made, from which you muſt then deſiſt when the part ſhall begin to grow hot and ſwell. If any too long continue theſe frictions and fomentations, he ſhall reſolve that which he hath drawn thither. For this we have oftentimes obſerved, that frictions and fomentations have contrary effects, according to the ſhortneſs and continuance of time. Pications will alſo conduce to this purpoſe, and other things which cuſtomarily are uſed to members troubled with an *atrophia*, or want of nouriſhment.

Remedies therefore.

VVhen we muſt deſiſt from fomenting and frictions.

CHAP. XXX. *Of fomentations which be uſed to broken bones.*

DIvers fomentations are uſed to broken bones for ſeverall cauſes. When we uſe warm water for a fomentation, we mean that, which is juſt between hot and cold, that is, which feels lukewarm to the hand of the Phyſitian and Patient. A fomentation of ſuch water uſed for ſome ſhort ſpace doth moderately heat, attenuate and prepare for reſolution, the humor which is in the ſurface of the body, it draws blood and an alimentary humor to the part labouring of an *atrophia*; it aſſwages pain, relaxes that which is too much extended, and moderately heats the member refrigerated through occaſion of too ſtrait binding, or by any other means. On the contrary, too hot fomenting cools by accident, digeſting and diſcuſſing the hot humor which was contained in the member. We mean a ſhort time is ſpent in fomenting, when the part begins to grow red and ſwell; a juſt ſpace, when the part is manifeſtly red and ſwoln: but we conjecture, that much or too much time is ſpent thereon, if the redneſs, which formerly appeared, go away, and the tumor, which lifted up the part, ſubſide. Alſo in fomenting, you muſt have regard to the body whereto it is uſed. For if it be plethorick, an indifferent fomentation will diſtend the part with plenty of ſuperfluous humors; but if it be lean and ſpare, it will make the part more fleſhy and ſucculent. Now it remains, that we ſay ſomewhat of the fracture of the bones of the feet.

VVarme water. The effects thereof.

Notes of ſhort, juſt, and too long fomenting. Fomentations hurt plethorick bodies.

CHAP. XXXI. *Of the fracture of the bones of the feet.*

THe bones of the inſtep, back and toes of the feet, may be fractured as the bones of the hands may. Wherefore theſe ſhall be cured like them, but that the bones of the toes muſt not be kept in a crooked poſture, as the bones of the fingers muſt, leſt their action ſhould periſh or be depraved. For as we uſe our legs to walk, ſo we uſe our feet to ſtand. Beſides alſo the Patient ſhall keep his bed untill they be knit.

VVhy the fractured bones of the foot muſt be kept in a ſtreight poſture.

The end of the fifteenth Book.

OF DISLOCATIONS, or LVXATIONS.

THE SIXTEENTH BOOK.

CHAP. I. *Of the kinds and manners of diſlocations.*

A Diſlocation is the departure or falling out of the head of a bone from its proper cavity, into an accuſtomed place beſides nature, hindring voluntary motion. There is another kind of Luxation, which is cauſed by a violent diſtention, and as it were a certain divarication, and dilatation, or extenſion into length and bredth of the ligaments, and all the nervous bodies, which contain, ſtrengthen, and bind together the joints. Thus thoſe who have been tormented and racked, have that thick ligament which is in the inner cavity of the huckle bone too violently extended. Thoſe who have ſuffered the Strappado, have the ligaments encompaſſing the articulation of the arm bone, with the ſhoulder blade, forcibly and violently diſtended. Such alſo is their affect, whoſe foot is ſtrained by ſlipping. There is a third kinde of luxation, when as thoſe bones which are joined contiguous, and one (as it were) bound to the ſides of another, gape or fly aſunder: as in the arm, when the ell parts from the wand; in the leg, when the one ſcile flyes from the other: yet this may be referred to the ſecond ſort of diſlocations, becauſe it happens not without dilatation,

VVhat a Luxation properly ſo called is. VVhat a Luxation not properly ſo called is.

The third kind of diſlocation.

The fourth. tion, or else the breaking of the ligaments. There is also a fourth added to these, as when the *Epiphyses* and heads of bones are plucked from the bone whereon they were placed or fastned: which unproperly called kind of Luxation, hath place chiefly in the bones of young people, and it is known by the impotency of the part, and by the noise and grating together of the crackling bones when they are handled. Now the bones of young folks are also incident to another casualty: for as the bones of old people are broken by violence by reason of their drineſs and hardneſs, thus the bones of children are bended or crooked in by reason of their naturall softneſs and humidity.

CHAP. II. *Of the differences of Dislocations.*

What Luxations are simple. SOme Dislocations are simple, others compound. We term them simple which have no other preternaturall affect joined with them; and such compound, as are complicated with one or more preternaturall affects; as when a dislocation is associated with a wound, fracture, great pain, inflammation, and an abscess. For, through occasion of these we are often compelled so long to let alone the luxation, until these be remitted of themselves, or by our art. Some Dislocations are complete and perfect, as when the bone wholly fals out of its cavity: other some are unperfect, as when it is only lightly moved, & not wholly fallen out; wherefore we only cal them subluxations or straint. Differences of Luxations are also drawn from the place: for sometimes the bone is wrested forwards, otherwhiles backwards, upwards, downwards; somewhiles it may be wrested, according to all these differences of site, and otherwhiles only according to some of them. Differences are also taken from the condition of the dislocated Joint in greatneſse and littleneſs, from the superficiary or deep excavation of the *sinus* or hollowneſs; and lastly from the time, as if it be lately done, or of some long continuance. I have judged it fit to set down all these, for that there are severall indications of curing, according to the varietie of each of these, as we shall teach hereafter.

What compound.

What a complete Luxation is.

What a subluxation or strain.

CHAP. III. *Of the causes of Dislocations.*

Internall causes of dislocations. THere are three generall causes of Luxations, internall, externall, and hereditarie. The internall are excrementitious humors and flatulencies, which, setling into the joints with great force and plentie, do so make slippery, soften and relax the ligaments which bind together the bones, that they easily fal out of their cavities, or else they so fil & distend these ligaments, and make them so short, that being contracted, they also contract the *appendices* of the bones from whence they arise, and so pluck them from the bone whereon they are placed, or else draw the heads of the bones out of their cavities, chiefly if the violence of a noxious humor doth also concur, which possessing and filling up the cavities of the joints, puts them from their seats, as it oft-times happens to the joint of the hip by Sciaticaes, and to the *Vertebræ* of the spine, by whose Luxation people become gibbous, or otherwise crooked. But externall causes of Dislocations are, fals from high, bruising and heavy blowes, the Rack, strappado, slipping in going, and all such like things, which may force the heads of the bones to fly out of their seats, or cavities, which also happens sometimes to infants in their birth, when as they are too carelesly and violently drawn forth by the Midwife, so that either their arms or legs are put out of joint. Hereditarie causes are such as the Parents transfuse into their off-spring: hence it is, that crooked not necessarily, but oftentimes are generated by crooked, and lame by lame. The truth whereof is evident by daily experience. Besides also *Hippocrates* himself avers, that infants in the very womb may have their Joints dislocated by a fall, blow and compression, and by the too much humidity and looſneſs of the Joints: whence also we see many crook legg'd and footed from their nativity; so that none need marvell or make any doubt hereof. We have read it observed by *Galen In librum de Artic.* that children may have impostumes in their mothers wombs, which may cast forth quitture, the ulcers being opened of their own accord, and be cicatrized by the only benefit of nature. It also happens to many from their first conformation, that the cavities of their Joints are lesse depress than they should be, and that their verges are more dilated than they ought to be; whereby it happens that the heads of the bones can the lesse enter into them. It falls out, that other some have the ligaments, appointed by nature for fastning together the bones of the joint, whether inserted or placed about, so weak, that from their first originall they are not of sufficient strength, or else abound with much Phlegm, either bred together with them, or flowing from some other place; so that by their too much slipperineſs they lesse faithfully contain the knittings or articulations of the bones. In all these as the bones are easily dislocated, so they may presently be easily restored without the assistance of a Surgeon, as I have sometimes observed in some.

Externall causes.

Hereditarie causes.

Sect. 3. sent. 8. & 9. sect. 8. 2. 4. sent. 3. & 4. lib. de art.

Children may have Impostumes in their mothers wombs.

CHAP. IIII. *The signs of dislocations.*

The common sign of all dislocations. SOme of the signs whereby we come to the knowledg of a luxated bone, are common to all dislocations; others are proper only to severall Luxations. It is a common sign, that there is alwaies a tumor in that part whereto the bone runs, and a hollowneſs on that side from whence it is flown. Now the proper signs shall be shewed, when as we come to treat of the particular kindes of Luxations. We know a perfect Dislocation by the lost action of the part, that is to say, the lost motion; pain also breeds a suspicion of a dislocation: for the head of the bone, which (moved out of its place) is forced into another, presses the flesh, and distends the nerves also moved out of their place. Hereto also conduces the comparing of the sound joint with that which is hurt, in which collation, it is fit the sound part, which is compared with the hurt, be no waies, neither by nature nor any accident, wronged, nor defor-

deformed, nor withered or decayed, nor swoln above measure, otherwise it may cozen and deceive you, if you be lesse warie. Labour and difficulty of action in moving, is a sign of an uncomplete Luxation, or strain. Now we thus know, that the ligaments, serving to the connexion of the articulations, are extended and relaxed, if the head of the bone, pressed with your fingers, be easily driven unto the contrary part, and sodainly fly thence back again; if thrusting your finger into the joint, it easily enter, nothing resisting it, as though all were empty within; if the motion be difficult, or none at all.

Signs of an unperfect dislocation.

CHAP. V. *Of Prognosticks to be made upon luxations.*

ALL Joints may be perverted or luxated, but all of them cannot in like manner be restored. For the head may be dislocated, but thereupon present death ensues, by reason of the compression of the whole spinall marrow presently at the originall thereof; such also is the dislocation of a *vertebra* of the spine, and of the Jaw-bone, which, slipped forth on both sides, hath caused inflammation, and a great tumor before that it be set. The bones of other Joints, as they are more or lesse dislocated, and moved out of their seats, so may they be more easily or difficultly restored. For, by how much they are the lesse moved out of their places, by so much they are the more quickly, and by how much they are the further, by so much they are the more slowly and difficultly set. Also an indication, taken from the figure of the luxated bone, gives a sign of the easie or hard restoring of the dislocation; as in the Arm, by how much the bones be the more easily dislocated, by so much once luxated they are the more easily restored. Bones do not easily fall out of joint in fleshy bodies; but when they chance to be put out, they are not easily got in again. For in such, the articulation is straitly on every side held in by the thickness of the muscles, and the plenty of the fat lying thereabouts. On the contrarie, such as are lean, especially those who formerly have been more fat, have their joints more lax, whereby it comes to passe, that their bones may easily be put forth of joint: besides also, through the default of the digestive facultie, they have their joints replete with mucous humors; whence it is, that the heads of the bones, as standing in a slippery place, are the lesse stable, as it is recorded by *Hippocrates*. But slender bodies, which are naturally dry, compact and dense, have their muscles and ligaments more strong and dry; wherefore their bones are the more difficultly displaced; and displaced, the more difficultly set. Some bones, joined amongst themselves, do sometimes fly a sunder, as when the shoulder blade flyes from the collar-bone at the *Acromium*, and in the Arm the Ell from the Wand, and in the Leg the one focile from the other, and the Heel-bone from the Ancle. Bones thus separated will never be joined together again, will never recover their former comely figure, never their strength of action. For, then it most usually happens, that the ligaments are either broke asunder, or else resolved and become lax. Those whose bones are dislocated by an externall cause, they, after they be set, may easily fall out again, for that the ligaments, moistened and bedewed with an excrementitious humor, cannot firmly hold them: oft-times the ligaments are not wholly broken, but only in some portion thereof; and hence the action of the part either perishes, or is debilitated. Also that dislocation is uncurable, when as the ligaments, steeped and swoln up with an excrementitious hnmidity, are so much shortened and contracted in their length, as they have acquired in their breadth: and thus they draw away and pluck off the *appendices* of the bones from whence they arise, and by reason the bone and the *appendix* do enter and receive each other by many cavities and prominencies, therefore they cannot, by how skilfull hand soever they be handled, be again fitly placed and put together. Old and inveterate dislocations, wherein a tough humor possessing the cavity is concrete in stead of the head of the bone, are not to be restored; as neither when the heads of the luxated bones have by continuall attrition made themselves a new cavity in the neighbouring bone: neither if they be restored, is the restitution firm and of continuance; because the naturall cavity is possessed by another matter, and the new made near thereto cannot well and faithfully contain the received head of the bone. Those who have their shoulder dislocated, may use their hand for many actions, as well as the opposite sound hand; for the weight of the body is not sustained by the hands as it is by the legs. And by how much the hand is the more exercised, by so much the arm becomes the more corpulent. Contrarily, if the thigh-bone be dislocated, especially if it be wrested inwards, the whole leg quickly decayes by an *atrophia*, because the part doth absolutely lose all motion: for by the opinion of *Hippocrates*, the performance of the proper action encreases strength, and makes the part in better plight; but idleness debilitates and makes it lean. If a great wound and fracture be joined with a luxation, there is danger, lest while we use extention for restoring the part, we draw the nerves too violently; and so break the nerves, veins and arteries, whence would ensue fear of inflammation, convulsion, and other malign symptomes. Wherefore *Hippocrates* judges it better in such a concourse and complication of preternaturall affects, absolutely not to meddle at all with the setting of the dislocated bone: for, by attempting the restitution, certain death, but by omitting it only lameness is to be feared. Every dislocation must be restored before inflammation come; but if it be already present, you must presently be carefull to take it away. For other things, let the Patient rest, lest if the affect be irritated, the increase and excesse of pain cause a convulsion, gangrene, and lastly death, as I remember I have sometimes observed. Therefore when inflammation, and other malign symptomes shall be mitigated and corrected, then may you endevour to restore the luxation, especially if the habit of the body and member affected may admit it. For if the body be slender, delicate and tender, then the restitution will be more speedy and facile. But on the contrary, more difficult, if it be grosse and compact; And let thus much suffice for prognosticks in Luxations.

VVhat luxations be uncurable.

VVhy those bones which are hardly dislocated, are hard to be set.

Sect. 1. de artic. sent. 29.

Celsius lib. 8. cap. 11.

VVhy the plucking of an *appendix* from a bone is uncurable.

Hipp. sent. 88 sect. 3. de art.

Sent. 10. sect. 5. lib. 6. epid & sect. 3. de art. sent. 88.

You must not endevour to set an inflamed joint.

CHAP.

CHAP. VI. *Of the generall cure of Dislocations.*

Five inventions in curing dislocations.

FOr all that I have heretofore delivered the generall method of curing fractures and dislocations, yet it shall not be unprofitable to repeat here In this place, those things which may be accommodated to this Treatise of curing luxations. Now he that will cure dislocations, must have regard to five intentions, which it will be fitting to perform in order. The first is, of holding; the second, of drawing or extending; the third, of forcing in; the fourth, of placing in convenient figure and site; the fifth, of correcting the concomitant, or following symptomes.

The benefit of holding the member in dislocations.

The first scope, which we said was of holding, is meant either of the whole body, or else of some part thereof only. The whole body must be holden by the strong embracement of your servant or attendant, when as the shoulder, the *vertebræ*, or the thigh bones are dislocated. But in the dislocation of the collar-bone, elbow, hand, knee, or foot and leg, it is sufficient only to hold the part straitly in your hands. There is necessity of holding either the body, or else some part thereof, lest, while the dislocated bone is extended, the whole body follow by continuance of parts, if there be nothing which may hinder: for if the body should follow him that draws or extends, all the work-masters labour and endeavour to restore it, is to no purpose.

The use of extension.

The use of the second scope, that is, of drawing or extending, is, that there may be a free space and distance between the luxated bones, by which distance the dislocated bone may the more freely be forced into its cavity. But the manner of drawing or extending is different in quantity and manner, according to the various strength of the muscles and ligaments, and dislocation of the bones to this or that part. Therefore this work is almost alwayes performed by the hands; which when they cannot suffice, we must use the assistance of instruments and engins, whose figures you shall see hereafter delineated.

The manner of setting it, or putting it into its place.

But that you may not do amiss, you may so far use extension, untill the head of the bone be brought just against its cavity. When the Surgeon hath brought it to this pass, then must he hasten to the third intention, which is, to put the head of the bone first moved and gently bended, into its cavity. For he must have a speciall care, that he force it no other way than into its proper cavity: for it would be dangerous, lest he should turn it from one extream into another, and the bone, for examples sake, of the thigh, which was dislocated into the fore-part by too violent forcing, by exceeding the middle cavity, may be driven and dislocated into the hinder part. To shun this, the bone shall be put back the same way that it fell out, which may be easily done in fresh and late happening dislocations.

Signs that the bone is set.

We understand that the bone is set by the noise, or as it were a popp, or sound like that, which solid and sounding bodies, being fully and forcibly thrust into their cavities, do make; by the similitude & consent in figure, magnitude and all conformation of the affected part with the sound, and lastly, by the mitigation of the pain.

The benefit of replacing the member.

The fourth scope, which is of the convenient site of the part, must be so fulfilled, that the bone after it is set may be kept in its cavity, and not fly forth again. Wherefore if the arm be dislocated, it shall be carryed bound up in a scarf: if the thigh, knee, leg, or foot be luxated, they shall be fitly laid in a bed; but in the *interim* the Surgeon, presently after he hath set them, shall have a care, that the affected joint be wrapped about with stoups and clothes, or compresses steeped in rose vinegar, and spred with convenient medicins, then let it be bound with an artificiall deligation, rowling the ligatures unto the part contrary to that whereto the dislocated bone flew.

The manner of binding up the set joint.

For the which purpose thicker boulsters shall be there applied whence the bone came out, otherwise there will be some danger, lest it should be again displaced: when these things are done, he shall for four or five daies space meddle with nothing about the dislocation, unless pain, or some such like symptome happen. For then the fifth scope will call us from that cessation and rest, which is, to correct the symptomes and complicate affections, as pain, inflammation, a wound, fracture, and others,

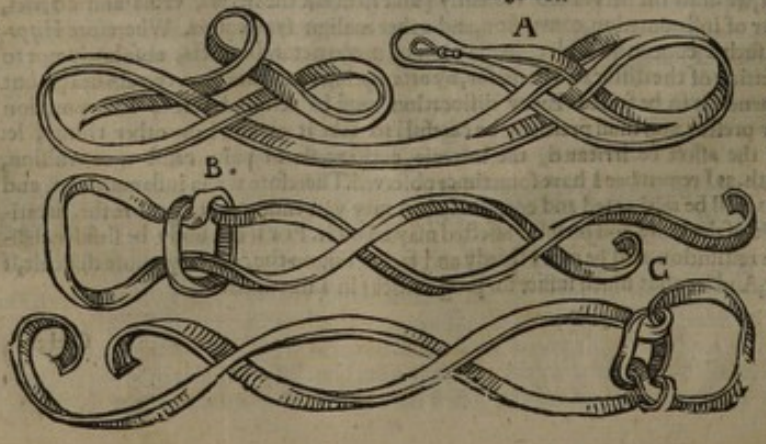
The cure of inveterate luxations.

whereof we have spoken abundantly in our Treatise of Fractures. Before we attempt to set inveterate dislocations, we must endeavour to humect the ligaments, tendons and muscles by fomentations, cataplasms, emplasters, liniments, and other remedies, that so these parts may be more obedient to the Surgeons hand; then must the dislocated bones be moved with a gentle motion up and down, to and again, that by this means the excrementitious humour, which by continuance of time hath flowed down, may wax hot, be attenuated, resolved or made slippery, and also the fibres of the muscles, ligaments, and nervous bodies, placed about the joint for the defence thereof, may be loosed, that so they may presently be more freely extended. But if a great swelling, pain, and inflammation urge, we must first think of assuaging and curing them, then of the restoring the dislocation.

CHAP. VII. *The description of certain engines, serving for the restoring of Dislocations.*

The delineation of the three Ligatures.

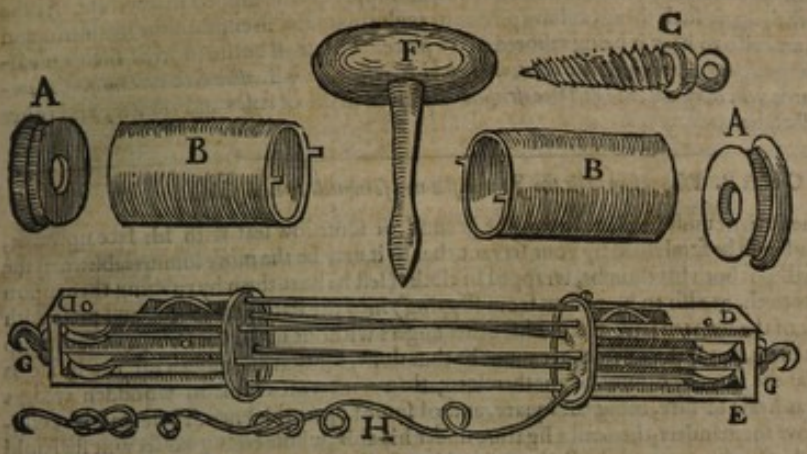
These ligatures are not for deligation, but extension.



BEfore I come to the particular kinds of dislocations, I think it not amiss to describe three sorts of bandages, and give you their figures, as those which are most fit to hold and extend dislocations. The first ligature, designed by this letter *A*, is made for holding the member. The second, marked with the letter *B*, is fit for

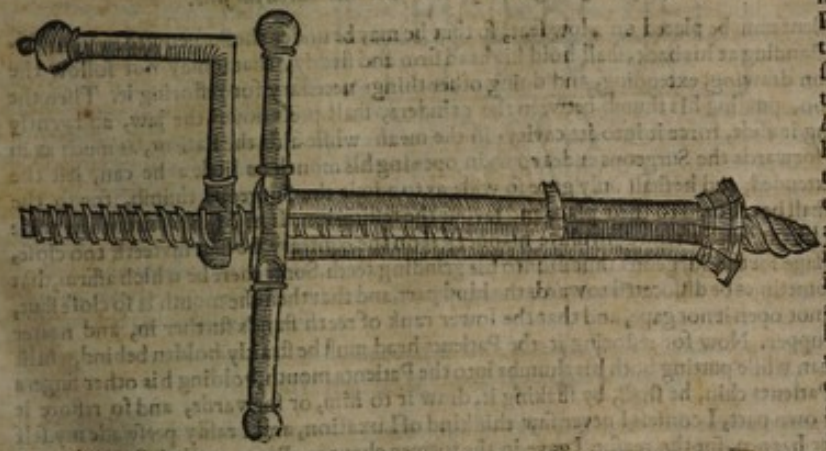
for drawing or extension, and consists of one knot. The third, whereto the letter *C* is put, consisting of two knots, is to hold or bind more straitly.

A Pulley.



I have thought good also to delineate the following Engine, made for to draw and extend more powerfully, when the hand will not serve. It is made like a Pulley, marked with these letters *DD*. Within this there lye hid 3. wheels, through whose furrowes runs the rope which is to be drawn, marked with this letter *H*. At the ends of the pulley are hooks fastned, the one of which is to fasten the Pulley to a Post, the other is to draw the ligature fastned to the part. The Boxes or Cases wherein the Pulley is kept, is marked with *B B*. Their Covers are marked with *A A*. A screw pin which may be twined, and so fastned to a Post, that so one of the ends of the pulley may be hooked thereto, is signed with *C*. A Gimlet (marked by *F*.) to make a hole in a Post, so to let in the screw pin. You may see all these things expresst in the precedent figure.

Manubrium versatile, or, *A Handvice.*



Some Practitioners in stead of this Pulley, make use of this described instrument, which they terme *Manubrium versatile*, or a Handvice. The end thereof is fashioned like a Gimblet, and is to be twined into a Post. Within that handle lies a screw with a hooked end; whereto the string or ligature must be fastned. Now the screw rod or male-screw runs into the female by twining about of the handle, and thus the ligature is drawn as much as will suffice, for the setting the dislocated bone. Having delivered these things thus in generall, now I come to treat of the Luxations of each part, from the jaw bone even to the toes of the feet.

CHAP. VIII. *Of the dislocation of the Jaw bone.*

THe Jaw bone is dislocated by many occasions, and not seldome by yawning, and other more strong openings of the mouth. It is more frequently luxated into the fore, than into the hinder part, by reason of the mammillary additaments, which hinder it from falling backwards. The dislocation is sometimes but on one side, otherwhiles on both. If the one side only be luxated, it (together with the chin) is drawn awry unto the contrary side which is not dislocated; the place is hollow from whence it is flown, but swoln whither it is gone, the Patient cannot shut his mouth, but is forc't to gape, so that he cannot eat; the Jaw, together with the teeth therein, hangs somewhat forwards, neither do the teeth answer fitly to one another, but the dog teeth are under the shearers. But if both sides be dislocated, all the jaw and chin hang forwards and towards the breast; besides also, the temporall muscles appear distended, spittle runs out of the Patients mouth against his will, the lower teeth stand further forth than the upper, which is the occasion that the mouth cannot be shut, neither the tongue have free volubility to speak, the Patient stammering in his speech. When it is dislocated on both sides, it is more difficultly restored, and all the symptomes are more vehement; wherefore it must be set with all speed, otherwise the Patient will presently have grievous pain about his throat, inflammation, a feaver, whereupon oft times death ensues within ten dayes, by reason of the five branches of nerves, which, arising from the second and fifth conjugation of the brain, are distributed into the moving muscles thereof, which too violently extended, brings

The causes, Differences, Signs that only one part is dislocated.

Signs that both sides are dislocated.

Prognostick.

Why death quickly ensues upon the dislocation of both sides of the jaw.

bring the forementioned symptomes. Practitioners affirm, that the Jaw twelve dayes after it is set, is free from the danger of relapse. If it have been dislocated some few dayes before you go about to restore it, you must use softning and relaxing medicins to it; but when it is put in the joint, apply a medicine made of the whites of egs, and oil of roses to asswage pain, and apply cloths dipped in oxycrate. At the second dressing you shall apply such things as have power to agglutinate and strengthen the ligaments and other relaxed parts, and also to keep it being restored in its place. This shall be the form of such a medicine. An astringent medicine. R. *Pulv. boli armeni, sang. draconis, farinæ volat. mastich. picis, resinæ, an. ʒ. ß. albuminis ovorum q. s. fiat medicamentum*; afterwards you may use *emplast. Diachalcitheos* dissolved in oil of roses and vinegar, and other things, as occasion shall be.

CHAP. IX. *How to set the Jaw dislocated forwards on both sides.*

The first manner of setting a jaw bone. FIrst of all the Patient must be placed upon the ground, or some low seat with his face upwards, and his head must be firmly held by your servant, that so it may be the more immoveable: then the Surgeon shall put both his thumbs, wrapped in cloths (lest he hurt them by rubbing them upon the Patients teeth, as also to keep them from slipping) into the Patients mouth, and press with them the larger teeth of the luxated jaw, but put his other fingers without under his chin, and so lift up the whole jaw with them. Another. But if the operation cannot be thus done, for that the mouth on the inside is so shut and closed that the thumbs cannot be put thereinto, then must you thrust in woodden wedges made of soft wood, as hazle or firre, being cut square, and of some fingers thickness. These shall be wedged in on each side above the grinders; then cast a ligature under his chin, whose ends your servant shal hold in his hands, and setting his knees upon the Patients shoulders, shall pull them upwards; then at the same time the Surgeon shall press downwards the woodden wedges. The jaw bones thus restored, shall be kept so by convenient ligation, and dressed with medicins, as it is fitting; and in the mean space you must forbid the Patient to speak, or needlesly to open his mouth. Diet. Wherefore he must abstain from hard meats, and such as require much chewing, untill his pain be quite passed, and use only spoon meats, as Barley-creams, ponadoes, jellies, cullasses, broths, and the like.

CHAP. X. *Of restoring the Jaw dislocated forwards but on one side.*

What the Surgeon. THe Patient must be placed on a low seat, so that he may be under the Surgeon; then your servant, standing at his back, shall hold his head firm and steddy, that it may not follow the Surgeon drawing, extending, and doing other things necessary for restoring it. Then the Surgeon, putting his thumb between the grinders, shall press down the jaw, and gently drawing it aside, force it into its cavity; in the mean while also the Patient, as much as in What the Patient ought to do him lyes, shall help forwards the Surgeons endeavour, in opening his mouth as little as he can, lest the muscles should be extended; and he shall only gape so wide as to admit the Surgeons thumb, for so the temporall muscles shall be restored to their place and favour the restitution. If he open his mouth as wide as he can, they will be extended after a convulsive manner; if on the contrary he shut his teeth too close, Signs that the jaw is dislocated backwards. there will be no passage for the Surgeons thumb unto his grinding teeth. Some there be which affirm, that the jaw bone may sometimes be dislocated towards the hind part, and that then the mouth is so close shut, that the Patient cannot open it nor gape, and that the lower rank of teeth stands further in, and nearer the throat than the upper. The cure. Now for restoring it, the Patients head must be straitly holden behind, whilst the Surgeon, the mean while putting both his thumbs into the Patients mouth, holding his other fingers without under the Patients chin, he shall, by shaking it, draw it to him, or forwards, and so restore it to its place. For my own part, I confess I never saw this kind of Luxation, and I easily perswade my self that it can scarce ever happen, for the reason I gave in the former chapter. But nevertheless, if it by any means chance to happen, yet can it not be a perfect luxation, but an imperfect one; the jaw being only but a little thrust back to the throat to those mammillary additaments. And then it may easily be restored by lifting or drawing forth the jaw, and suddenly forcing it from below upwards.

CHAP. XI. *Of the Luxation of the Collar bone.*

Differences of the luxated collar bones. AS the Collar bones may be broken, wrested and crooked, so also they may be dislocated. Now they are dislocated, either against the *sternum*, or against the shoulder blade, or *acromion* thereof: yet both these kinds of dislocations are very rare, by reason of the strait and firm connexion which the collar bone hath with the foresaid parts; but chiefly where it is joined to the *sternum*, The cure. it can scarce be depress, for that it is as it were underprop with the first rib. But it may be dislocated inwardly, outwardly, and side-wise, and according to this variety there must be divers wayes to restore it; yet generally the collar bone is put into its place by moving or extending the arm. But if need require, the Patient shall be laid upon the ground with his face upwards, a Tray with the bottome upwards, a hard stuffed cushion, or the like thing being put under his shoulders; for thus it will so come to pass, that the shoulder and chest will stand so forth, that presently by lifting up, by pressing down, or drawing forth the arm forwards or backwards, as the bone shall be flown out to this or that part, you may restore it; for thus the prominency may be forced into its cavity. But it will be requisite to bind it up and lay boulsters thereon, and to give it rest, as if it were fractured. Com. ad sent. 62. sect. 1. de art. *Galen* writes, that when he was five and thirty years old, whilst he exercised himself in the place of exercise, his collar bone was so far separated from the *Acromion*, that there was the space of three fingers between them. And that this luxation was restored

in

in forty dayes space, by so strait and strong a ligation, that he perceived the motion of the beating arteries under the bone. But you shall find very few, who will suffer such strait ligation so long, though it be never so necessary. Verily, this kind of luxation is hard to be known, but far more difficult to be healed. I have known many Surgeons deceived, who have taken the luxation of the collar bone for the dislocation of the top of the shoulder. For then the *Epomis* or top of the shoulder swels, and the place from whence the collar bone is flown, is depressed with a manifest cavity, with vehement pain, inflammation, and impotency of lifting up, or otherwise moving the arm, or performing other actions which are done by the help of the shoulder. Certainly, if this bone, when it is dislocated, be not set, the Patient shall be lame during his life, so that he shall not be able, neither to put his hand to his head nor mouth.

CHAP. XII. *Of the luxation of the Spine, or Back bone.*

THe Back bone consists of many bony *vertebræ*, like rowls or wheels mutually jointed or knit together, by their smoothness and circular form conspiring to an aptness of moving or bending forwards. For if it should consist of one bone, we should stand continually with the trunk of our bodies immoveable, as thrust through with a stake. The *vertebræ* have a hole passing through the midst of them, whereby the marrow, passing this way out from the brain as by a pipe, may serve for the generation of the sensitive and motive nerves, and their distribution into all parts beneath the head. For which purpose it is perforated with many holes on the sides, through each whereof certain conjugations of the nerves pass forth into the rest of the body, and veins and arteries pass in for the propagation of nourishment and life. The whole exterior face of the Spine is rough, and as it were armed with four sorts of *apophyses*, or processes, whereof some stand up, others down; some direct, others transverse. Wherefore from these thorny and sharp processes, the whole hath acquired the name of the *Spina*. The *vertebræ* the further from the neck they are, the greater they grow, so that those which are the lowest, are the largest, for it is agreeable to reason, that that which bears, should be bigger than that which is born. Hence we see, that the holy bone is placed under the rest as a foundation. The side processes of the rack bones of the chest, besides the benefit of defending the spinall marrow shut up therein from externall injuries, have also another, which is, they firm and fasten the bones of the ribs by a strong tye. There lyes a gristle, and a tough, and (as it were) albuminous humor between the *vertebræ*, which makes them, as also all the other joints of the body, slippery, and fit for motion: the spine is flexible with notable agility forwards only, but not backwards, for that so there would be continuall danger of breaking the hollow ascendent vein, and the great descending artery running thereunder. Therefore the dearticulations of the *vertebræ*, mutually strengthened with strong ligaments, do look more backwards. I have thought good to premise these things of the nature of the spine, before I come to dislocations happening thereto: I willingly omit divers other things which are most copiously delivered by *Galen*, content only to adde thus much; that there is nothing to be found in the whole structure of mans bones, which more clearly manifests the industry of Gods great workmanship, than this composure of the spine and the *vertebræ* thereof.

An anatomicall description of the Spine.

The variety of the processes of the Spine.

Gal. cap. 7 lib. 13. de usu partium.

Lib. 13. de usu partium.

CHAP. XIII. *Of the dislocation of the head.*

THe head stands upon the neck knit by dearticulation to the first *vertebræ* thereof, by the interposition of two processes which arise from the *basis* thereof, near the hole through which the marrow of the brain passes down into the back bone, and they are received by fit cavities, hollowed in this first *vertebra*. These processes sometimes fall out of their cavities, and cause a dislocation behind, whereby the spinall marrow is too violently and hard compressed, bruised and extended, the chin is fastned to the breast, and the Patient can neither drink nor speak: wherefore death speedily follows upon this kind of luxation, not through any fault of the Surgeon, but by the greatness of the disease, refusing all cure.

The connexion of the head with the first Rack bone of the neck. Prognosticks.

CHAP. XIV. *Of the dislocation of the* vertebræ, *or rack bones of the neck.*

THe other *vertebræ* of the neck may be both dislocated and strained. Dislocation verily, unless it be speedily helped, brings sudden death: for, by this means the spinal marrow is presently oppress at the very originall thereof, and the nerves, therehence arising, suffer also together therewith, and principally those which serve for respiration; whereby it cometh to pass, that the *animal* spirit cannot come and disperse its self into the rest of the body lying thereunder; hence proceed sudden inflammation, the squinsie, and a difficulty, or rather a defect of breathing. But a strain or incompleat luxation brings not the like calamity: by this the *vertebræ*, a little moved out of their seats, are turned a little to the hind or fore-part, then the neck is wrested aside, the face looks black, and there is difficulty of speaking and breathing. Such, whether dislocation or strain, is thus restored. The Patient must be set upon a low seat, and then one must lean and lye with his whole weight upon his shoulders;

The danger hereof.

Signs and symptoms of their subluxation. The cure.

Signs of their reſtitution.

and the mean while the Surgeon muſt take the Patients head, about his ears, betwixt his hands, and ſo ſhake and move it to every part, untill the *vertebra* be reſtored to its place. We may know it is ſet by the ſudden ceaſing of the pain, which before grievouſly afflicted the Patient, and by the free turning and moving his head and neck every way. After the reſtoring it, the head muſt be inclined to the part oppoſite to the Luxation, and the neck muſt be bound up about the dearticulation of the ſhoulder; but yet ſo, that the ligature be not too ſtrait, leſt by preſſing the weazon and gullet, it ſtraiten the paſſages of breathing and ſwallowing.

CHAP. XV. *Of the Diſlocated* Vertebræ *of the Back.*

Differences and ſignes.

THe Rack bones of the back may be diſlocated inwards, outwards, to the right ſide and to the left. We know they are diſlocated inwards, when as they leave a depreſſed cavity in the ſpine; outwardly, when they make a bunch on the back; and we know they are luxated to the right or left ſide, when as they obliquely bunch forth to this or that ſide. The *vertebræ* are diſlocated by a cauſe either internall, or externall, as is common to all other Luxations; the internall is either the defluxion of humors from the whole body, or any part to them and their ligaments; or elſe a congeſtion proceeding from the proper and native weakneſs of theſe parts; or an attraction ariſing from pain and heat. The externall is a fall from high upon ſome hard body, a heavie and bruiſing blow, much and often ſtooping, as in Dreſſers and Lookers to Vineyards, and Paviers, decrepit old men; and alſo ſuch, as through an incurable diſlocation of the thigh-bone, are forced in walking to ſtoop down, and hold their hand upon their thigh. But a *vertebra* cannot be forced or thruſt inwards, unleſſe by a great deal of violence; and if it at any time happen, it is not but with the breaking of the tyes and ligaments, for they will break rather than ſuffer ſo great extenſion. Such a diſlocation is deadly, for that the ſpinall marrow is exceedingly violated by too ſtrait compreſſion, whence proceeds dulneſs, and loſſe of ſenſe in the members lying thereunder. Neither is reſtitution to be hoped for, becauſe we cannot through the belly force it into its place: the urine is then ſuppreſt, as alſo the excrements of the belly; ſometimes on the contrary, both of them break forth againſt the Patients minde, the knees and legs grow cold, their ſenſe and motion being loſt. Such things happen more frequently, when the ſpine is luxated inwards, than when it is diſlocated outwards, for that the nerves, thence ariſing, run and are carryed more inwardly into the body. Beſides the preſſed Spinall marrow becomes inflamed; and that being inflamed, the parts of the ſame kind, & ſuch as are joined thereto, are alſo inflamed by conſent, whence it happeneth, that the bladder cannot caſt forth the urine. Now where the ſinews are preſſed, they can no more receive the irradiation of the animal faculty. Hence followes the deprivation of the ſenſe and motion in the parts whereto they are carryed, therefore the contained excrements do no more provoke to expulſion by their troubleſome ſenſe, neither are preſſed to keep them in; thence proceeds their ſuppreſſion, and hence their breaking forth againſt their wils. But the ſpine outwardly diſlocated, ſcarce cauſes any compreſſion of the marrow or nerves.

Causes.

The danger of a *vertebra* diſlocated inwards.

Hipp. ſent. 51. ſect. 3. de artic. Gal. in com.

CHAP. XVI. *How to reſtore the Spine outwardly diſlocated.*

THe *vertebræ* outwardly diſlocated, when as they ſtand bunching forth, then it is fit to lay and ſtretch forth the Patient upon a table, with his face downwards, and ſtraitly to bind him about with towels under the arm-pits, and about the flanks and thighs. And then to draw and extend, as much as we can, upwards and downwards, yet without violence: for unleſs ſuch extenſion be made, reſtitution is not to be hoped for, by reaſon of the proceſſes and hollowed cavities of the *vertebræ*, whereby, for the faſter knitting, they mutually receive each other. Then muſt youlye with your hands upon the extuberancyes, and force in the prominent *vertebra*. But if it cannot be thus reſtored, then wil it be convenient to wrappe two peeces of wood, of four

The cure.

Another manner of cure.

four fingers long, and one thick, more or lesse, in linnen cloths, and so to apply one on each side of the dislocated *vertebræ*; and so with your hands to press them against the bunching forth *vertebræ*, untill you force them back into their seats, just after the manner you see it before delineated.

In the mean while have a care, that you touch not the processes which stand up in the ridg of the Spine, for they are easily broken. You may know that the *vertebræ* are restored by the equall smoothnesse of the whole Spine. It is fit, after you have restored it, to bind up the part, and lay splints or plates of Lead neatly made for that purpose upon it; but so, that they may not press the crists or middle processes of the *vertebræ*, which I formerly mentioned, but only the sides: then the Patient shall be laid upon his back in his bed, and the splints long kept on, lest the *vertebræ* should fall out again.

How to keep the restored *vertebræ* in their places.

CHAP. XVIII. *A more particular inquirie of the dislocation of the* Vertebræ, *proceeding from an internall cause.*

THe *vertebræ* are in like sort luxated by the antecedent cause, as we have formerly said, which is caused by the naturall imbecillitie of the parts, principally of the nervous ligament, by which all the *vertebræ* are bound each to other; this ligament comes not to the spinall marrow, but only bindes together the *vertebræ* on their outsides. For, besides the two membranes proceeding from the two *Meninges* of the Brain, wherewith the marrow is covered, there is a third strong and nervous coat put upon it, lest, whilst the spine is diversly bended, the bended marrow should be broken. This third coat arises from the *pericranium*, as soon as it arrives at the first *vertebra* of the neck. Now that ligament, wherewith we said the joints of the *vertebræ* were mutually knit and fastned, is encompassed with a tough and glutinous humor for the freer motion of the *vertebræ*. Sometimes another cold, crude, gross and viscid humor, confused and mixed herewith by great defluxions and catarrhs, begets a tumor, which doth not only distend the nerves proceeding forth of the holes of the *vertebræ*, but also distends the ligaments wherewith they are bound together: which so distended, and (as it were) drawn aside, do draw together with them the *vertebræ*, one while towards the right side, another while to the left, somewhiles inwards, otherwhiles outwards, and thus move them out of their seats, and dislocate them. A dislocated *vertebra*, standing forth and making a bunch, is termed in Greek *Cyphosis*, (Those thus affected we may call, *Bunch-backt*. But when it is depressed, it is named *Lordosis*, (Such we may term, *Saddle-backt*.) But when the same is luxated to the right or left side, it maketh a *Scoliosis* (or *Crooked-nesse*,) which wresting the spine, draws it into the similitude of this letter S. *Galen* adds a fourth default of the *vertebræ*, which is, when their joints are moved by reason of the looseness of their ligaments, the *vertebræ* yet remaining in their places, and he cals it a *Seisis* (or shaking.) They also note another defect peculiar to the spinall marrow, which is, when as it (the *vertebræ* being not moved whereto it adheres) is plucked and severed from them: this disease is occasioned by a fall from on high, by a great stroak, and by all occasions which may much shake, and consequently depresse the spinall marrow, or by any other means remove, or put it forth of its place. Scarce any recovers of this disease, for many reasons, which any exercised in the art, may easily think upon: But let us return to the internall cause of Luxations. Fluid and soft bodies, such as Childrens, usually are very subject to generate this internall cause of defluxion. If externall occasions shall concur with these internall causes, the *vertebræ* will sooner be dislocated. Thus Nurses, whilst they too straitly lace the breasts and sides of girles, so to make them slender, cause the breast-bone to cast its self in forwards or backwards, or else the one shoulder to be bigger or fuller, the other more spare and lean. The same error is committed, if they lay children more frequently and long upon their sides, than upon their backs; or if, taking them up when they wake, they take them only by the feet or legs, and never put their other hand under their backs, never so much as thinking that children grow most towards their heads.

Cyphosis. Lordosis. Scoliosis.

Com ad sent 2. sect. 3. libr. de art. Seisis.

The separation of the spinall marrow from the en compassing *vertebræ*.

The error of Nurses in binding and lacing of Children.

CHAP. XVIII. *Prognosticks of the Dislocated* Vertebræ *of the back.*

IF in Infancy it happen that the *vertebræ* of the back shall be dislocated, the ribs will grow little or nothing in breadth, but run outwards before; therefore the chest loseth its naturall latitude, and stands out with a sharp point. Hence they become asthmatick, the lungs and muscles which serve for breathing, being pressed together and straitned; and that they may the easilier breath, they are forced to hold up their heads, whence also they seem to have great throats. Now because the weazen being thus pressed, the breath is carryed through a strait passage; therefore they wheese as they breath, and snort in their sleep, for that their lungs, which receive and send forth the breath or air, be of lesse bignesse: besides also, they are subject to great distillations upon their lungs, whereby it cometh to pass, that they are shorter lived. But such as are bunch-backed below the midriffe, are incident to diseases of the kidneys and bladder, and have smaller and slenderer thighs and legs, and they more slowly and sparingly cast forth hair and have beards; to conclude, they are lesse fruitfull, and more subject to barrenness, than such as have their crookedness above their midriffe. The Bunches which proceed from external causes are oft-times curable; but such as have their original from an inward cause, are absolutely uncurable, unless they be withstood at the first with great care and

Hipp. sent. 6. sect. 3. de art.

VVhy, when the spine is luxated, the parts belonging to the chest are nourished and grow the lesse.

and industry. Wherefore such as have it by kind, never are helped. Such as, whilst they are yet children, before their bodies be come to perfect growth, have their spine crooked and bunching out, their bodies use not to grow at the spine, but their legs and arms come to their perfect and full growth; yet the parts belonging to their breasts and back, become more slender. Neither is it any wonder, for seeing the veins, arteries, and nerves are not in their places, the spirits do neither freely, nor the alimentary juices plenteously flow by these straitened passages, whence leanness must needs ensue: but the limbs shall thence have no wrong, for that not the whole body, but the neighbouring parts only are infected with the contagion of this evil. When divers *vertebræ*, following each other in order, are together and at one time dislocated, the dislocation is less dangerous, than if one alone were luxated. For, when one only *vertebra* is dislocated, it carries the spinall marrow so away with it, that it forces it almost into a sharp angle; wherefore being more straitly pressed, it must necessarily be either broken or hurt, which is absolutely deadly, for that it is the brains substitute. But when divers *vertebræ* are dislocated at once, it must of necessity be forced only into an obtuse angle, or rather a semicircle; by which compression it certainly suffers, but not so, as that death must necessarily ensue thereof. Hereto may seem to belong that which is pronounced by *Hippocrates*; a circular moving of the *vertebræ* out of their places is less dangerous than an angular.

VVhy the luxation of one *vertebra* is more dangerous than of many.

Sent. 51. *sect.* 3. *lib. de art.*

CHAP. XIX. *Of the dislocation of the rump.*

The signs.

THe rump oft-times is after a sort dislocated inwards by a violent fall upon the buttocks, or a great blow; in this affect the Patient cannot bring his heel to his buttocks, neither, unless with much force, bend his knee. Going to stool is painfull to him, neither can he sit unless in a hollow chair. That this (as it were) dislocation may be restored, you must thrust your finger in by the Fundament, even to the place affected,

The cure.

as we have said in a fracture; then must you strongly raise up the bone, and with your other hand at the same time join it rightly on the outside with the neighbouring parts; lastly, it must be strengthened with the formerly mentioned remedies, and kept in its place. Now it will be recovered about the twentieth day after it is set. During all which time the Patient must not go to stool, unless sitting upon a hollow seat, lest the bone, as yet scarce well recovered, should fall again out of its place.

CHAP. XX. *Of the luxation of the ribs.*

Causes.

THe ribs may by a great and bruising stroak be dislocated, and fall from the *vertebræ* whereto they are articulated, and they may be driven inwards, or sidewaies. Of which kind of luxation, though there be no particular mention made by the Ancients, yet they confess, that all the bones may fall, or be removed from their seats or cavities,

Signs.

wherein they are received and articulated. The sign of a rib dislocated and slipped on one side, is, a manifest inequality; which here makes a hollowness, and there a bunching forth; but it is a sign that it is driven in, when as there is only a depressed cavity where it is knit and fastned to the *vertebræ*. Such dislocations cause divers symptoms, as difficulty of breathing, the hurt rib hindring the free moving of the chest; a painfulness in bowing down, or lifting up the body, occasioned by a pain counterfeiting a pleurisie; the rising or puffing up of the musculous flesh about the rib, by a mucous and flatulent humor there generated: the reasons whereof we formerly mentioned in our Treatise of Fractures. To withstand all these, the dislocation must be forthwith restored, then the puffing up of the flesh must be helped. Wherefore, if the dislocated rib shall fall upon

Cure.

the upper side of the *vertebra*, the Patient shall be set upright, hanging by his arms upon the top of some high door or window: then the head of the rib, where it stands forth, shall be pressed down untill it be put into its cavity. Again, if the rib shall fall out upon the lower side of the *vertebra*, it wil be requisite, that the Patient bend his face downwards, setting his hands upon his knees; then the dislocation maybe restored by pressing or thrusting in the knot or bunch which stands forth.

Gal. com. ad sent. 3. *sect.* 1. *de art.*

But if the luxated rib fall inwards, it can no more be restored or drawn forth by the hand of the Surgeon, than a *vertebra* which is dislocated towards the inside, for the reasons formerly delivered.

CHAP. XXI. *Of a dislocated shoulder.*

VVhy there is no internall ligament from the arm bone to the shoulder blade.

THe shoulder is easily dislocated, because the ligaments of its dearticulation are soft and loose; as also for that the cavity of the shoulder blade is not very deep; and besides, it is every where smooth and polite, no otherwise than that of the shoulder bone, for that it is herein received. Adde hereunto, that there is no internall ligament from bone to bone, which may strengthen that dearticulation, as is in the leg and knee. Wherein notwithstanding, we must not think nature defective, but rather admire Gods providence in this thing; for that this articulation serves not only for extension and bending, as that of the Elbow, but besides, for a round or circular motion, as that which carries the arm round about, now up, then down,

Differences of a luxated shoulder.

according to each difference of site. The shoulder bone, which *Hippocrates* cals the arm bone, may be dislocated four manner of wayes, upwards, downwards, or into the arm-pit, forwards and outwards, but never backwards, or to the hind part. For, seeing that there the cavity of the blade bone, which receives the head of the arm-bone, which *Hippocrates* cals a joint, lyes and stands against it; who is it that can but imagin any such dislocation? In like sort it is never dislocated

Sent. 1. *sect.* 1. *lib. de art.*

inwardly

inwardly, for on this part it hath the flesh of a strong muscle, termed *Deltoides*, lying over it, besides also the back and *acromion* of the blade, and lastly, the anker-like, or beak-like process, all which four hinder this joint from slipping inwards. Now *Hippocrates* saith, that he hath only seen one kind of dislocation of this bone, to wit, that which is downwards or to the arm-pit: and certainly it is the most usuall and frequent; wherefore we intend to handle it in the first place. When the shoulder is dislocated downwards into the arm-pit, a depressed cavity may be perceived in the upper part of the joint; the *acromion* of the blade shewes more sharp and standing forth than ordinary, for that the head of the shoulder bone is slipt down, and hid under the arm-pit, causing a swelling forth in that place; the elbow also casts it self (as it were) outwards, and stands further off from the ribs; and though you force it, yet can you not make it to touch them; the Patient cannot lift up his hand to his ear on that side, neither to his mouth, nor shoulder. Which sign is not peculiar to the luxated shoulder, but common to it, affected with a contusion, fracture, inflammation, wound, abscess, *schirrus*, or any defluxion upon the nerves, arising out of the *vertebræ* of the neck, and sent into the arm: also this arm is longer than the other. Lastly, (which also is common to each difference of a luxated shoulder) the Patient can move his arm by no kind of motion without sense of pain, by reason of the extended and pressed muscles, some also of their fibres being broken. There are six wayes to restore the shoulder luxated downwards into the arm-pit. The first is, when it is performed with ones fist, or a towel; the second, with a clew of yarn, which put under the arm-pit, shall be thrust up with ones heel; the third, with ones shoulder put under the arm hole, which manner, together with the first, is most fit for new and easily to be restored luxations, as in those who have loose flesh, and effeminate persons, as children, eunuches, and women; the fourth, with a ball put under the arm pit, and then the arm cast over a piece of wood held upon two mens shoulders, or two standing posts; the fifth, with a ladder; the sixth, with an instrument, called an *Ambi*. We will describe these six waies, and present them to your view.

Signs of the shoulder dislocated downwards.

The wayes to restore it.

CHAP. XXII. *Of the first manner of setting a shoulder, which is with ones fist.*

FIrst, let one of sufficient strength, placed on the opposite side, firmly hold the Patient upon the joint of the shoulder, lest he move up and down with his whole body, at the necessary extension, working & putting it in: then let another, taking hold of his arm above the elbow, so draw and extend it downwards, that the head thereof may be set just against its cavity, hollowed in the blade bone. Then at last let the Surgeon lift and force up with his fist the head of the bone into its cavity. Here this is chiefly to be observed, that in fresh luxations, especially in a body soft, effeminate, moist, and not over corpulent, that it sometimes comes to pass, that by the only means of just extension, the head of the bone freed from the muscles and other particles wherewith it was, as it were, entangled, will betake it self into its proper cavity; the muscles being by this means restored to their place and figure, and drawing the bone with them, as they draw themselves towards their heads, as it were with a sudden gird or twitch: wherefore in many, whilst we thought no such thing, it sufficed for restitution only to have extended the arm. But if the luxation be inveterate, and the hand cannot serve, then must the Patients shoulder be fastned to a post with the forementioned ligature, or else committed to ones charge, who may stand at his back and hold him fast. Then the arm shall presently be tyed about, a little above the elbow, with a fillet, whereto a cord shall be fastned; which being put or fastned to the pulley, shal be drawn or stretched forth, as much as need shall require. Lastly the Surgeon, with a towel, or such like ligature, fastned about his neck and hanging down, and so put under the Patients arm-pit near to the luxation, shall, raising himselfe upon his feet with the whole strength of his neck, lift up the shoulder, and also at the same time bringing his arm to the Patients breast, shall set the head of the shoulder bone, forced with both his hands into its cavity, as you may see by the precedent figure. Then must you cover all the adjacent parts with a medicine made *ex farina volatili, bolo armenio, myrtillis, pice, resina & alumine*, beaten into powder, and mixed with the white of

An expression of the first manner of putting a shoulder into joint.

Gal. com. ad sent. 23. sect. 1. de art.

A perfect setting the luxated shoulder by extension only.

of an eg. Then muſt the hollowneſs under the arm be filled with a clew of woollen or cotten yarn, or a linnen cloth ſpred over with a little oil of Roſes or Myrtles, a little vinegar, and *unguentum roſatum*, or *infrigidans Galeni*, leſt it ſtick to the hairs, if there be any there. The part muſt afterwards be bound up with a ligature, conſiſting of two heads, of ſome five fingers bredth, and two els long; more or leſs, according as the body ſhall require. The midſt thereof ſhall be put immediately under the arm pit, and then croſſed over the lame ſhoulder, and ſo croſſing it as much as ſhall be fit, it ſhall be wrapped under the oppoſite arm. And laſtly, the arm ſhall be laid upon the breaſt, and put in a ſcarf, in a middle figure almoſt to right angles, ſo that by lifting up the hand he may almoſt touch his ſound ſhoulder, leſt the bone newly ſet, may fall out again; neither ſhall the firſt dreſſing be ſtirred, untill four or five dayes be paſt, unleſs the greatneſs of ſome happening ſymptome divert us from this our purpoſe.

CHAP. XII. *Of the ſecond manner of reſtoring a ſhoulder, that is, with the heel; when as the Patient by reaſon of pain can neither ſit, nor ſtand.*

Hip. ſent. 12. ſect. 1. de art.

THe Patient muſt be laid with his back on the ground upon a cover-lid, or mat, and a clew of yarn or leathern ball, ſtuffed with tow or cotten, of ſuch bigneſs as may ſerve to fill up the cavity, muſt be put under his arm-pit, that ſo the bone may ſtraight waies the more eaſily be forced by the heel into its cavity. Then let the Surgeon ſit beſide him, even over againſt the luxated ſhoulder; and if his right ſhoulder be luxated, he ſhall put his right heel to the ball, which fille d up the arm-pit; but if the left, then the left heel; then let him forthwith draw towards him the Patients arm, taking hold thereof with both his hands, and at the ſame inſtant of time ſtrongly preſs the arm-pit with his heel. Whilſt this is in doing, one ſhall ſtand at the Patients back, who ſhall lift up his ſhoulder with a towel, or ſome ſuch thing fitted for that purpoſe, and alſo with his heel preſs down the top of the ſhoulder blade: another alſo ſhal ſit on the other ſide of the Patient, who, holding him, ſhal hinder him from ſtirring this way or that way at the neceſſary extenſion in ſetting it, as you may ſee it expreſt by the precedent figure.

The expreſſion of the ſecond manner of reſtoring a ſhoulder.

CHAP. XXIV. *Of the third manner of reſtoring a ſhoulder.*

SOme one who is of a competent height and ſtrength ſhall put the ſharp part of the top of his ſhoulder under the Patients arm-pit, and alſo at the ſame time ſhall ſomewhat violently draw his arme towards his owne breaſt, ſo that the Patients whole body may (as it were) hang thereby. In the mean time another, for the greater impreſſion, ſhall lay his weight on the luxated ſhoulder, ſhaking it with his whole body. Thus the ſhoulder, drawn downwards by the one which ſtands under the arm-hole, and moved and ſhaken by the other, who hangs upon it, may be reſtored into its ſeat, by the help of the Surgeon concurring therewith, and with his hand governing theſe violent motions, as this figure ſhewes.

The figure of the third manner of putting a ſhoulder into joint.

CHAP.

CHAP. XXV. *Of the fourth manner of restoring a dislocated shoulder.*

The figure of the fourth manner of restoring the shoulder.

YOu must take a perch, or piece of wood (somewhat resembling that which the Water-bearers of *Paris* use to put on their shoulders) some two inches broad, and some six foot long; in the midst hereof let there be fastned a clew of yarn, or ball of sufficient bigness to fill up the cavity of the arm-hole. Let there be two pins put in, one on each side of the ball, each alike distant therefrom, with which, as with staies, the shoulder may be kept in, and upon the ball, that it slip not away from it. Let two strong men, taller than the Patient, either by nature or art; put this perch upon their shoulders; then let the Patient put his arm-pit upon that place where the ball stands up; the Surgeon must be ready to pull his hanging arm downwards. Thus the Patient shall (as it were) hang on the perch with his shoulder, and so the head of the bone shall be forced into its cavity, as this figure declares; wherein you may see the perch or yoak, with the two woodden pins and ball fastned in the midst, delineated by its self.

CHAP. XXVI. *Of the fifth manner of putting the shoulder into joint, which is performed by a Ladder.*

The delineation of the fifth manner of restoring a shoulder.

YOu may also restore a shoulder dislocated into the arm-pit, by the help of a Ladder, after this manner. Let some round body, as a ball, or clew of yarn, which (as we formerly said) may serve to fill the arm-pit, be fastned upon one of the upper steps of a Ladder; at the foot of the Ladder set a low stool, whereupon let the Patient mount; then bind both his legs, and also his sound arm behind his back, lest, when you are about your operation, he hinder and spoil all you do, by laying his hand, or setting his foot upon the ladder. Then let his arm be presently put over the step of the Ladder, and his arm-pit put upon the there fastned ball, the Patient in the mean while being wished to come with his whole body as near unto the steps of the Ladder as he is able; for otherwise, besides that there is no other hope of restoring the luxation, there would be no small danger of breaking the shoulder bone. Also let him take heed, that he put not his head between the steps. Then his arm, bound above the Elbow with filletting, or some other ligature fit for that purpose, shall be drawn down by the hand of some that assist you, and at the same time let the stool be plucked from under his feet, so that he may hang upon the ladder. Thus by this means the head of the shoulder will be restored by its self, the endeavour of the Surgeon assisting, and pressing down the shoulder blade, and moving it to and again. The bone being

being set, the stool, which a little before was plucked from under the Patients feet, shall be put there again, that he may, with the more ease and less pain, pull back his arm from the step of the Ladder. For if he should lift it high up to draw it over, there would be danger, left being newly set, and not well staid, the head of the bone might fall out again. I have thought good to have all these things here expressed, that you may learn this operation, as if you see it done before you. I have not thought fit in this place to omit the industry of *Nicholas Picart*, the Duke of *Guises* his Surgeon; who being called to a certain Country-man to set his shoulder being out of joint, and finding none in the place besides the Patient and his wife, who might assist him in this work, he put the Patient, bound after the forementioned manner, to a Ladder; then immediately he tyed a staffe at the lower end of the Ligature, which was fastned about the Patients arm above his elbow; then put it so tyed under one of the steps of the Ladder, as low as he could, and got astride thereupon, and sate thereon with his whole weight, and at the same instant made his wife to pluck the stool from under his feet: which being done, the bone presently came into its place, as you may see by the following figure.

Another figure expressing the fourth manner of restoring a dislocated shoulder.

Another figure to the same purpose.

If you have never a Ladder, you may use a peece of Wood, laid across upon two Posts. Also you may use a door, as the other figure shewes, wherein you must observe a flat piece of wood or *spatula* with strings thereat, whose use shall be shown in the following Chapter.

CHAP. XXVII. *The sixth manner of restoring a shoulder, luxated into the arm-pit.*

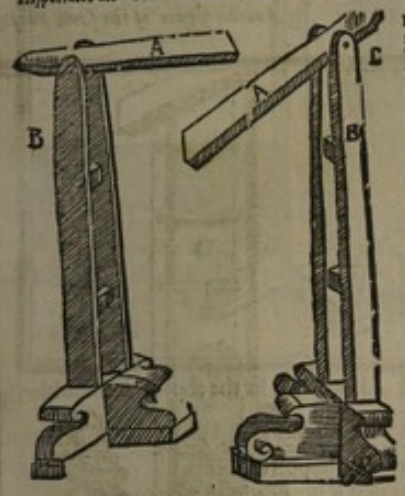
Sect. 1. lib. 1. de art. sent. 19.

Hippocrates writes, that this is the best way of all to restore a dislocated shoulder. You must take a woodden *spatula* of some four or five fingers bredth, and some two fingers thickness or less, but some yard or thereupon long; the one end thereof must be narrow and thin, with a round head standing up and lightly hollowed, that put under the arm-pit, it may receive part of the head of the shoulder bone, the which for that purpose must not bend towards the ribs, but to the top of the shoulder. This upper part of the *spatula* must be wrapped about with a linnen or woollen rag, or some such soft thing, that it may be the softer, and hurt the less; and then it must be so thrust under the arm-pit, that it may throughly penetrate into the inner part between the ribs, and the head of the shoulder bone. There must, besides in this *spatula*, be two holes in three severall places, each alike distant from other, through which let soft strings be put, whereby it may be tyed to the arm, stretched all the length thereof even to the fingers, in one place a little below the head of the shoulder bone, in another

The description of the *Glossocomium*, termed *Ambi*.

another a little above the elbow, and the third at the wriſt, that ſo they may hold it firm. Therefore let the diſtances of the holes be fitted to this purpoſe; but principally you muſt have a care of this, that the upper part of the *ſpatula*, reaching beyond the head of the arm, enter even to the innermoſt Cavity of the arm-pit; then, a croſſe pin or piece of wood muſt be made faſt through two poſts or a frame, and well faſtned thereto, and thereupon the Arm with the *ſpatula* muſt be ſo put over, that the pin may be under the arm-pit, the body weighing one way, and the arm another: which being done, the arm muſt be drawn down one way, and the body another about the pin. Now this croſſe pin muſt be put on ſuch a height that the Patient may ſtand on tiptoes. Now this is the very beſt way of reſtoring a ſhoulder. In ſtead of two poſts or a frame, you may make ſhift with a ladder, doore, beds poſts, and ſuch like things as ſhall be there preſent. I have heard *Henry Arvet*, a very good Surgeon of *Orleans* ſay, that he never attempted this manner of putting into joint a ſhoulder diſlocated into the arm-pit without good ſucceſſe, unleſſe by chance (which alſo is noted by *Hippocrates*) that the fleſh is grown into the cavity, and the head of the bone hath made it ſelf another cavity in the place whereinto it is fallen; for in this caſe the bone will either not be reſtored, or elſe not remain in its place, but fall back notwithſtanding into the new hollowed cavity, which ſerves it in ſtead of its naturall ſocket or cavity. But I muſt here admoniſh young Surgeons, that if the bone be not reſtored at the firſt endeavour and onſet, that they doe not deſpair and preſently deſiſt from their intended operation, but they muſt wind about, and gently move the joint: for ſo at the length it will be more eaſily moved, and enter into the naturall cavity. When it is in, it muſt be bound up with compreſſes and rowlers after the forementioned manner. *Sect.1.de art. ſent.21.*

Hippocrates his Gloſſocomium *termed* Ambi.



To the former figures I have thought good to adde this, which expreſſeth the manner of reſtoring a ſhoulder luxated into the arm pit with a *ſpatula* after the manner of *Hippocrates*. This *ſpatula* faſtned with an iron pin to the ſtanding frame may be turned, lifted up, and preſſed down at your pleaſure. A. ſhewes the wooden *ſpatula*. B. the frame or ſtanding poſts. *Hipp.ſent.64. 4.de artic.*

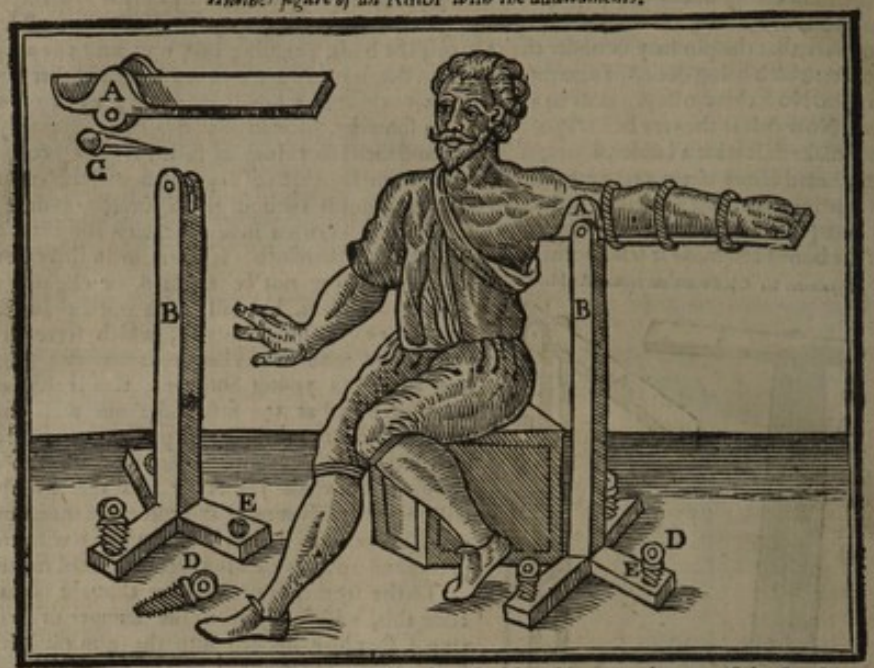
The figure of an Ambi *fitted to a diſlocated ſhoulder.*

For the more certain uſe of this inſtrument the Patient muſt ſit upon a ſeat which muſt be ſomewhat lower than the ſtanding frame, that ſo the *ſpatula* which is thruſt into the arm-pit may be the more forcibly depreſt, ſo to force in the head of the ſhoulder bone; the Patients feet muſt alſo be tyed, that he may not raiſe himſelf up whileſt the Surgeon endevours to reſtore it. Now he ſhall then endevour to reſtore it when he ſhall have bound the ſtretched forth arm of the diſlocated ſhoulder unto the *ſpatula*, and thruſt the one end thereof under the ſlipped forth head of the ſhoulder bone, as we have formerly ſhewed; for then by preſſing down the other end of the *ſpatula* which goes to the hand, the bone is forced into its cavity. You muſt diligently obſerve the wooden *ſpatula*, which therefore I have cauſed to be expreſſed by it ſelf, which *Hippocrates* calleth *Ambi*, whoſe head is a little hollowed where it is noted with this letter B. The whole *ſpatula* is marked with this letter A. with three ſtrings hanging thereat, provided for the binding of the arm, that it may be kept ſteddy, as you may perceive by the annexed figure. How to make uſe of the *Ambi*.

There

There are other additions to this *Ambi*, whoſe figure I now exhibited to your view, by the invention of *Nicholas Picart* the Duke of *Lorrain's* Surgeon, the uſe and knowledg whereof, beſtowed upon me by the inventor himſelf, I would not envie the ſtudious reader.

Another figure of an Ambi *with the additaments.*



AA. Shew the two eares, as it were, ſtops made to hold and keep in the top of the ſhoulder, leſt it ſhould ſlip out when it is put into the frame or ſupporter.

BB. The frame or ſupporter whereon the *Ambi* reſts.

CC. The pin or axeltree which faſtens the *Ambi* to the ſupporter.

DD. Screw-pins to faſten the foot of the ſupporter that it ſtir not in the operation.

EE. The holes in the foot of the ſupporter, whereby you may faſten the ſcrew-pins to the floor.

CHAP. XXVIII. *How to reſtore a ſhoulder diſlocated forwards.*

IT is ſeldome that the ſhoulder is luxated towards the foreſide; yet there is nothing ſo ſtable and firm in our bodies which may not be violated by a violent aſſault; ſo that thoſe bones do alſo fall out of joint, whoſe articulations are ſtrengthned for the firmer connexion with fleſhly, nervous, griſtly and bony ſtayes, or bars. This you may perceive by this kind of diſlocated ſhoulder, ſtrengthned as it were with a ſtrong wall on every hand; to wit, the *Acromium* and the end of the collar-bone, ſeeming to hinder it, as alſo the great and ſtrong muſcles, *Epomis*, and *Biceps*. *Hippocrates*, ſhut up within the ſtrait bounds of the leſſer *Aſia*, never ſaw this kind of diſlocation, which was obſerved five times by *Galen*. I profeſſe I have ſeen it but once, and that was in a certain Nun, which weary of the Nunnery, caſt her ſelf down out of a window, and bore the fall and weight of her body upon her elbow, ſo that her ſhoulder was diſlocated forwards. This kind of diſlocation is known by the depravation of the conformation or figure of the member, by the head of the ſhoulder wreſted out towards the breaſt, as alſo the Patient cannot bend his elbow. It is reſtored by the ſame meanes as other luxations of other parts, to wit, by ſtrait holding, extending, and forcing in. Therefore the Patient muſt be placed upon the ground with his face upwards, and then you muſt extend the ſhoulder otherwiſe than you do when it is luxated into the arm-pit. For when it falleth into the arm-hole, it is firſt drawn forwards, then forced upwards, untill it be brought juſt againſt the cavity whereinto it muſt enter. But in this kind of luxation, becauſe the top of the ſhoulder is in the fore parts of the dearticulation ſhut up with muſcles, opened both to the outer, as alſo to the inner part, you muſt worke to the contrary; to wit, to the hinde part. But firſt of all you muſt place a ſervant at the back of the Patient, who may draw back a ſtrong & broad Bandage caſt about the arm-pit (ſuch as is the *Carchefium*, which conſiſts of two contrary and continued ſtrings) leſt that when the arm ſhall be extended, the ſhoulder follow: alſo you muſt put a clew of yarn to fill up the arm-pit. Then muſt you extend the arm, caſting another ligature a little above the elbow, and in the interim have a care that the head thereof fall not into the arm-pit, which may be done both by putting the forementioned clew under the arm, and drawing the head another way; then muſt you permit, by ſlacking your extenſion, the joint freed from the encompaſſing muſcles, to be drawn and forced into its cavity by the muſcles forcible recoiling, as with an unanimous conſent, into themſelves and their originals, for thus it will eaſily be reſtored, and ſuch extenſion only is ſufficient thereto.

Com. ad ſent. 2 & 23. ſect. 1. de articulis.

Signs.

Cure.

Sect. 23. ſect. 1. de art.

CHAP.

CHAP. XXIX. *Of the ſhoulder luxated outwardly.*

THe diſlocation alſo of the ſhoulder to the outward parts ſeldome happens; but yet, if it may at any time happen, the extenſion of the arm will be very difficult, but yet more difficult towards the outward part than towards the inward; there is a depreſſed cavity perceived towards the cheſt; but externally a bunching forth, to wit, in that part from whence the head of the ſhoulder-bone is fled. For the reſtoring hereof, the Patient muſt be laid flat on his belly, and the elbow muſt be forcibly drawn contrary to that whereto it is fled, to wit, inwardly to the breaſt; and alſo the ſtanding forth head of the arm-bone muſt be forced into its cavity, for thus it ſhall be eaſily reſtored. But into what part ſoever the ſhoulder bone is diſlocated, the arm muſt be extended and drawn directly downwards. After the reſtitution fitting medicins ſhall be put about the joint. Let there be ſomewhat put into the arm-pit which may fil it up, and let compreſſes or boulſters be applyed to that part to which the luxated bone fels; then all theſe things ſhall be ſtrengthened and held faſt with a ſtrong and broad two headed ligature put under the arm-pit, and ſo brought acroſs upon the joint of the ſhoulder, and thence carryed unto the oppoſite arm-pit by ſo many windings as ſhall be judged requiſite. Then the arm muſt be put and carried in a ſcarf to right angles, which figure muſt be obſerved not only in every luxation of the ſhoulder, but in each fracture of the arm alſo, for that it is leſs painfull, and conſequently, ſuch as the arm may ſtand the longeſt therein without moving.

Signs.

The cure.

What to be done to hold in the ſhoulder after it is reſtored.

CHAP. XXX. *Of the ſhoulder diſlocated upwards.*

THe head of the ſhoulder alſo may ſometimes be luxated into the upper part. Which when it happens, it ſhewes it ſelf by bunching forth at the end of the collar bone, the hollowneſs of the arm-pit is found larger than uſuall, the elbow flyes further from the ribs than when it fell downwards, now the arm is wholly unable to perform the uſuall actions. It is fit for the reſtitution of ſuch a luxation, that the Surgeon ſtoop down, and put his ſhoulder under the Patients arm, and then ſtand up as high as he can upon his feet, and therewithall preſs down the head of the ſhoulder bone into the cavity, or elſe make ſome other to do it. Otherwiſe it is fit to lay the Patient upon his back on the ground, and whilſt ſome one extends the affected arm by drawing it downwards, the Surgeon with his own hand may force down the head of the bone into its cavity. The operation performed, the ſame things ſhall be done as in other luxations, compreſſes being applyed to that part whereto the bone flew, and it being alſo bound up with ligatures. Now you may underſtand in theſe four forementioned kinds of diſlocations, that the bone which was luxated is reſtored, by the ſound which ſhall be heard as you force it in, by the reſtitution of the accuſtomed actions, which are perceived by the bending, extending, and lifting it up, by the mitigation of the pain, and laſtly, by the collation and comparing of the affected arm with the ſound, and by its ſimilitude and equality therewith.

Signs.

Cure.

CHAP. XXXI. *Of the diſlocation of the elbow.*

THe elbow may alſo be four manner of wayes diſlocated; to wit, inwardly, outwardly, upwards, and downwards. By the part which is inwards, I mean that which looks towards the center of the body, when as the arm is placed in a naturall ſite, to wit, in a middle figure between prone and ſupine; I make the outward part, that which is contrary thereto. By the upper part I mean that which is towards the heaven, and by the lower that which is next to the earth: and by how much the joint of the elbow conſiſts of more heads and cavities then that of the ſhoulder, by ſo much when it is luxated it is the more difficultly ſet, and it is alſo more ſubject to inflammation, and to grow hard thereupon, as *Hippocrates* ſaith. Now the joint of the elbow is more difficultly diſlocated than that of the ſhoulder, and more hardly ſet, for that the bones of the cubit and arm do receive and enter each other by that manner of articulation which is termed *Ginglymus*, as we have formerly more at large treated in our Anatomy, and a little before in our Treatiſe of fractures. The elbow is therefore diſlocated, for that the proceſſes thereof are not turned about the ſhoulder bone in a full orb, and by an abſolute turning. Wherefore if at any time the cubit be bended more ſtraitly and cloſely than that the inner proceſs can retain its place and ſtation in the bottom of its *ſinus*, the hind proceſs falleth out and is diſlocated backwards. But when as the fore proceſs is extended more violently, and forced againſt the bottom of its cavity, it flyes and departs out of its place as beaten or forced thence, and this kind of luxation is far more difficultly reſtored than the former: adde hereunto that the utter extremity of the cubit, which is called *Olecranum*, is the higher, but the other inner is the lower; whence it is that every one can better and more eaſily bend than extend their cubits. Therefore ſuch a diſlocation is cauſed by a more violent force, than that which is made to the inner ſide. *The ſign of this luxation is, the arm remains extended, neither can it be bended, for the inner proceſſe ſtayes in the externall cavity which is hollowed in the bottom of the ſhoulder bone, which formerly was poſſeſſed by the inner part of the *Olecranum*; which thing makes the reſtitution difficult, for that this proceſſe is kept, as it were, impriſoned there. But when it falleth out diſlocated to the fore part, the arm is crooked, neither is it extended, and it is alſo ſhorter than the other. But if the elbow be fallen out of its place according to the other manner of diſlocations, to wit, upwards or downwards, the naturall figure thereof is perverted, for the

The Author ſeems not to agree with *Hip. Sent. ult. ſect. 3. fract.* and *Celſus* in the ſetting down the kinds of a diſlocated Elbow.

* The Author doth not agree with *Hippocr.* and *Celſus*, in ſetting down the notes of theſe diſlocations: for thoſe notes which are here attributed to an outward and inward luxation, theſe *Celſus* hath given to an elbow diſlocated towards the fore and out part: and thoſe which are here attributed to the elbow diſlocated upwards and downwards;

Inflammation hinders repoſition.

arm is ſtretched forth, but little notwithſtanding bended towards that part from whence the bone went, that is, figured after a middle manner between bending and extending thereof. What kind ſoever of diſlocation ſhall befall it, the action of the elbow will either not be at all, or certainly not well untill that it be reſtored to its former place; there is a ſwelling in the part whereinto it is flown, and a cavity there from whence it is fled, which alſo happens in the diſlocations of all other parts. Furthermore, one diſlocation of the elbow is compleat and perfect, another imperfect. The latter as it eaſily happens, and through a ſmall occaſion, ſo it is eaſily reſtored; but on the contrary a perfect, as it hardly happens, and not unleſſe with great violence, ſo it is not ſo eaſily reſtored again, eſpecially if that you do not prevent inflammation, for being inflamed it makes the reſtitution either difficult, or wholly impoſſible, principally that which falleth outwards.

CHAP. XXXII. *How to reſtore the elbow, diſlocated outwardly.*

Signe.

YOu may know that the elbow is diſlocated outwardly, if at any time you ſhall obſerve the arm to be diſtended, and not able to be bended. Wherefore you muſt forthwith undertake the reſtitution thereof, for fear of defluxion and inflammation which the bitterneſſe of pain uſually cauſeth, upon what part ſoever the luxation happen. There is one manner of reſtoring it, which is, you muſt cauſe one to hold hard and ſteddy the Patients arm a little under the joint of the ſhoulder, and in the mean while let the Surgeon draw the arm, taking hold thereof with his hand, and alſo force the ſhoulder bone outwards, and the eminency of the cubit inwards, but let him by little and little draw and extend the arm, wreſting it gently this way and that way, that he may bring back the bone which fell out into its cavity. I have thus expreſſely delivered this, that the young Surgeon may underſtand, that the arm muſt not be bended for the reſtoring of this kind of diſlocation; for reſtitution cannot ſo be hoped for, becauſe by this kind of luxation the inner proceſſe of the cubit poſſeſſeth the place of the exteriour proceſſe in the cavity of the ſhoulder bone. Wherefore whilſt the arm is bended or crooked, the cubit is only lifted up, and not drawn into its ſeat. But if we cannot attain to the reſtitution thereof with our hands alone, you muſt cauſe the diſlocated arm lightly bended to embrace a poſte, then muſt the end of the cubit called *Oleranum* be tyed or bound about with a ſtrong ligature or line, and then wreſted into its cavity by putting a battoon or ſtaff into the ligature, as is demonſtrated by this enſuing figure.

Cure.

A Caution.

A figure which ſhews the way how to reſtore the elbow, by putting it about a poſt, with a battoon.

A figure which ſhewes how to reſtore the elbow by only caſting a line about it.

There is alſo another more exquiſite way of reſtoring it, which is expreſſed by the latter figure wherein a line of ſome inch bredth is caſt about the *Oleranum* of the arm, embracing a poſt or pillar, and it is drawn ſo long, until the diſlocated bone be brought into its ſeat. Now we know that the bone is returned into its place, and reſtored, when the pain ceaſeth, and the figure and whole naturall conformation is reſtored to the arm, and the bending and extending thereof is eaſie, and not painfull.

CHAP

CHAP. XXXIII.

Of the Dislocation of the Elbow to the inside, and of a compleat and uncompleat Luxation.

IF the Elbow bè dislocated to the inner part, the arme must bee strongly and powerfully extended, then bended quickly and with sudden violence, so that his hand may smite upon his shoulder. Some put some round thing into the bought of the Elbow, and upon that do suddenly force the Elbow to the shoulder, as wee have formerly said. If the Cubit bone bee onely lightly moved out of its place into the upper or lower place, it is easily restored by drawing and forcing it into its cavity, after this following manner. Let two extend the arme, taking hold thereof at the shoulder and wrist, and each draw towards himselfe; and also the Surgeon (who shall there be present) shall force the bone which is dislocated from that part whereunto it is bended, unto the contrary: after he shall thus have restored it, hee shall lay the arme in a strait angle, and so binde it up, and apply fit medicins formerly mentioned, and so let him carry it in a scarfe put about his neck, as we said in the dislocation of the shoulder. *Hippocrates* bids, that the Patient, after it is set, shall often endeavour to bend his hand upwards and downwards, and also extend and bend his arme, yea, and also to attempt to list up some heavy thing with his hand; for so it will come to passe, that the ligaments of this joint may become more soft, ready, and able to performe their accustomed functions, and also the bones of the cubit and shoulder shall be freed from the affect termed *Ankylosis*, whereto they are incident by the luxations of this part. Now *Ankylosis* is a certaine preternaturall agglutination, coagmentation, and as it were union of sundry and severall bones in the same joint, which afterwards hinders the bending and extension thereof. Now, a *Callus* is generated in the elbow sooner than in any other articulation, whether it remaineth out, or be put into joint, by reason that by rest and cessation from the accustomed actions, a viscide humor which is placed naturally in the joints, as also another which is preternaturall, drawne thither by paine, floweth downe, and is hardned, and gleweth the bones together, as I have observed in many, by reason of the idlenesse and too long rest of this part. Wherefore, that we may withstand this affect, the whole ligation must be loosed sooner and oftner than otherwise, that is to say, every third day, and then the Patients arme must be gently moved every way. Within the space of twenty, or twenty five dayes, these restored bones recover their strength, sooner or later, according to the happening accidents. It is necessary also that the Surgeon know that the *Radius*, or Wand, sometimes falleth out when the Cubit or Ell is wholly dislocated; wherefore hee must bee mindfull in setting the Cubit, that hee also restore the Wand to its place; in the upper part it hath a round processe lightly hollowed, wherein it receiveth the shoulder bone: it hath also an eminency which admitteth the two headed muscle.

The cure.

Sect. 63. sect. 3. de fract.

Why the elbow is most subject to *Ankylosis*.

CHAP. XXXIV.

Of the Dislocation of the Styliformis, or bodkin-like processe of the cubit or ell.

THE processe of the Ell called *Styloides*, being articulated to the wrist by *Diarthrosis*, by which it is received in a small cavity, is dislocated, and falleth out sometimes inwards, somewhiles outwards. The cause usually is the falling of the body from high upon the hands. It is restored, if that you force it into its seat, diligently binde it, and apply thereto very astringent and drying medicines. But yet, though you shall diligently performe all things which may bee done in dislocations, yet you shall never so bring it to passe that this bone shall bee perfectly restored, and absolutely put into the place where hence it went: which thing wee have read, observed by *Hippocrates*; when (saith hee) the greater bone, to wit, the Ell, is removed from the other, that is, the wand, it is not easily restored to its owne nature againe; for that,

Differences and causes.

Cure.

Sect. 1. sect. 2. & sent. ult sect. 3. de fract.

that, ſeeing that neither any other common connexion of two bones, which they call *Symphyſis* or union, when it is drawne aſunder and deſtroyed, may be reduced into its former nature, by reaſon theſe ligaments wherewith they were formerly contained, and as it were continued, are too violently diſtended and relaxed, whence it happens, that I have in theſe caſes often obſerved, that the diligence and care of the Surgeon hath nothing availed.

CHAP. XXXV.

Of the diſlocation of the Wriſt.

Here, as before chap. 31. the Author diſſents from *Celſus* and *Hippocrat.* in expreſſing the names and ſigns of theſe diſlocations.

WE underſtand by the Wriſt, a certaine bony body, conſiſting of a compoſure of eight bones knit to the whole Cubit by *Diarthroſis*. For the Wriſt conſidered wholly in its ſelfe, is knit and articulated with the Ell and Wand: with that, againſt the little finger; with this, againſt the thumb: for thus as it were by two connexions, the joint is made more firme. Yet may it be diſlocated inwardly, outwardly, and towards the ſides. Wee ſay it is luxated inwardly when the hand ſtands upwards, but outwardly, when it is crookt in and cannot be extended. But if it chance to be diſlocated ſidewayes, it ſtands awry either towards the little finger, or elſe towards the thumbe, as the luxation befals to this or that ſide. The cauſe hereof may ſeeme to depend upon the different dearticulation of the Ell and Wand with the Hand or Wriſt. For the Wand, which is articulated on the lower part with the Wriſt at the thumbe, by its upper part, whilſt it receives the outward ſwelling or condyle of the Ell in its cavity, performes the circular motions of the hands. But the Cubit or Ell, which in like ſort is connected on the lower part by *Diarthroſis* at the little finger with the Wriſt, being articulated on the upper part with the ſhoulder bone bends and extends, or ſtretches forth the hand. There is one way to reſtore the formerly mentioned diſlocations. The arme on one ſide and the hand on another muſt be extended upon a hard reſiſting and ſmooth place, ſo that it may lye flat; and you muſt have a care that the part whence the diſlocated bone fell, be the lower in its ſite and place, and the part whither it is gone, the higher. Then to conclude, the prominencies of the bones muſt be preſſed down by the hand of the Surgeon, untill by the force of compreſſion and ſite the luxated bones be thruſt and forced into their places and cavities.

CHAP. XXXVI.

Of the diſlocated bones of the Wriſt.

Signe.

THE Wriſt conſiſts of eight bones, which cannot, unleſſe by extraordinary violence, be put or fall out of their places. Yet if they ſhall at any time fall out, they will ſhew it by the tumour of the part whereto they are gone, and by the depreſſion of that wherefrom they are fled. They may bee reſtored, if the diſeaſed hand be extended upon a table; and if the bones ſhall be diſlocated inwards, the hand ſhall bee placed with the palme upwards, then the Surgeon ſhall, with the palme of his hand, preſſe downe the eminencies of the bones, and force each bone into its place. But if the luxation bee outwards, hee ſhall lay the palme next to the table, and preſſe it after the ſame manner. To conclude, if the luxation ſhall be toward either ſide, the luxated bones ſhall be thruſt towards the contrary, and the reſtored bones ſhall be preſently contained in their places with fit remedies, binding, rowling, and carrying the hand in a ſcarfe.

Cure.

Chap. XXXVII.

Of the dislocated bones of the After-wrest.

THere are four bones in the Palm or After-wrest, the two middlemost whereof cannot bee dislocated side-waies, becaus they are hindred and kept from falling aside by the opposition of the parts, as it were resisting them. Neither can that which answereth to the little finger, nor that whereon the fore-finger rest's, bee dislocated towards that side which is next the middle bones, whereof wee now spake, but onely on the other side, free'd from the neighbor-hood of the bones: but all of them may bee dislocated inwardly and outwardly. They may bee restored as those of the Wrest. *Celsus lib. 8. cap. 18.*

Chap. XXXVIII.

Of the dislocated Finger.

ALso the bones of the fingers may bee four several waies dislocated, inwardly, outwardly, and at each side. To restore them, they must bee laid straight upon a table, and so put into joint again. For thus they may bee easily restored, by reason their sockets are not deep, and their joints are shorter, and ligaments less strong. In twelv daies space they will recover their strength, as also those dislocations that happen to the Wrest and After-wrest. Why the dislocated fingers may bee easily restored.

Of a dislocated Thigh, or Hip.

Chap. XXXIX.

THe Thigh or Hip may bee dislocated, and fall forth towards all the four parts But most frequently inwards, next to that outwards, but verie seldom either forwards or backwards. A subluxation cannot happen in this joint, as neither in the shoulder, especially from an external caus, contrarie to which it usually happen's in the elbow, hand, knee, and foot. The caus hereof is, for that the heads of the thigh and shoulder-bone are exactly round, and the sockets which receiv them have certain borders and edges encompassing them: hereunto may bee added, that strong muscles encompas each dearticulation, so that it cannot com to pas that part of the heads of such bones may bee conteined in the cavitie, and other parts stand or fal forth, but that they will quickly bee restored to their places by the motion and wheeling about of the joint, and the strength of the encompassing muscles. But a subluxation may seem to happen in these parts from an internal caus. For then the ligaments and ties being softned and relaxed, cannot draw and carrie back the head of the bone standing forth so far as the edges of the socket. If the Hip bee dislocated towards the inner part, that leg becom's longer and larger then the other, but the knee appear's somwhat lower, and look's outwardly with the whole foot, neither can the patient stand upon his leg. To conclude, the head of the Thigh-bone bewray's it self lying in the groin, with a swelling manifest both to the eie and hand; now the leg is longer then that which is sound, for that the head of the thigh is out of it's socket or cavitie, and situated lower, to wit, in the groin, therefore the leg is made by so much the larger. Now the knee stand's forth, becaus necessarily the lower head of the thigh-bone stand's contrarie to the socket. For this is common to all dislocated bones, that when as the dislocation happen's to the one side, the other end of the bone flie's out to the contrarie. Whence it is, that if the upper-head of the thigh-bone shall fall inwards, then the other head, which is at the knee, must necessarily look outwards. The like happen's in other dislocations. The leg cannot bee bended towards the groin, for that the dislocated bone hold's the extending muscles of the same part so stiffly stretched out, that they cannot yeeld, or applie themselvs to the benders. For flexion or bending ought to precede extension, and extension, flexion. *Hip. sent. 68. sect. 3. de art.* *Gal. com. ad sent. 47. sect. 4. de art.* A subluxation may befal the Thigh from an internal caus.

CHAP. XL.

Prognoſticks belonging to a diſlocated Hip.

Why the thigh-bone diſlocated, is difficultly reſtored, or reſtored, eaſily fall's out again.

THere is this danger in the diſlocations of the Hip, that either the bone cannot bee put into the place again, at leaſt unleſs with very much trouble, or elſ beeing put in, that it may preſently fall out again. For if the tendons of the muſcles, the ligaments, and other nervous parts of the member bee hard and ſtrong, they, by reaſon of their contumacie and ſtiffneſs will hardly ſuffer the bone to return to its place. If that they bee ſoft, looſ, effeminate and weak, they will not contain the reſtored bone in its place. Neither will it bee any better contained, if that ſhort, but yet ſtrong and round ligament, which faſten's the head of the Thigh-bone on the inſide in the Socket or Cavitie of the huckle-bone, bee broken or relaxed. Now it may bee broken by ſom violent ſhock or accident, it may bee relaxed by the congeſtion and long ſtay of ſom excrementitious, tough and viſcuous humor lying about the joint, through which means it waxeth ſoft. But if it bee broken, how often ſoever the bone bee reſtored, it will preſently fall out again. If it bee relaxed, there is onely this hope to contain the reſtored bone, that is, To conſume and draw away the heaped up humiditie by application of Medicines and Cauteries of both kindes, for which purpoſe thoſe are more effectual which do actually burn, for that they drie and ſtrengthen more powerfully. Leanneſs of the bodie, and the want of *Aponeuroſes*, that is, of broad tendont and external ligaments, whereof many encompaſs the knee, encreaſe's the difficultie of containing it in the place. But the parts adjoining to the diſlocated and not-ſet-bone fall away by little and little, and conſume with an *Atrophia* or want of nouriſhment; both becauſ the part it ſelf is forced to deſiſt from the accuſtomed actions and functions, as alſo for that the veins, arteries and nervs beeing more ſtraitned and put out of their places, hinder the ſpirits and nouriſhment from flowing ſo freely as they ought, to the part: whence it com's to paſs, that the part it ſelf is made more weak, the native heat beeing debilitated through idleneſs, it can neither attract the alimentarie juice, neither can it digeſt and aſſimilate that little thereof which flow's and falleth thereto. Verily the Thigh-bone, as long as it is forth of the cavitie, grow's no more after the manner as the other bones of the bodie do, and therefore in ſom ſpace of time you may perceiv it to bee ſhorter then the ſound bone. Notwithſtanding the bones of the leg and foot are not hindered of their growth, for that they are not out of their proper places. Now for that the whole leg appear's more ſlender, you muſt think that happen's onely by the extenuation and leanneſs of the proper muſcles thereof. The ſame thing happen's to the whole hand, in the largeſt acception, when as the ſhoulder is out of joint, unleſs that the calamitie and loſs hereof is the leſs. For the ſhoulder beeing forth of joint you may do ſomthing with your hand, whereby it will com to paſs that no ſmal portion of nouriſhent may flow down into theſe parts. But the Thigh-bone beeing diſlocated, eſpecially inwards in a childe unborn, or an infant, much leſs alimentarie nouriſhment flow's to that part, becauſ it can much leſs uſe the foot and leg by reaſon of the diſlocation of the Hip, then it can do the hand by a luxation of the ſhoulder. But now wee muſt thus underſtand that which is ſaid by *Hippocrates*, That diſlocated bones and not reſtored do decreaſ or are hindered from their juſt growth, to bee onely in thoſe who have not yet attained to their full and naturally-appointed growth in every dimenſion. For in men of full growth, the bones which are not reſtored, becom more ſlender, but yet no ſhorter, as appear's by that which hee hath delivered of the ſhoulder.

Gal. com. ad ſent. 42 ſect. 4. de art.

Hippocrates explained ſect. 1. & 3. lib. de art.

CHAP. XLI.

Of the ſigns of the Hip diſlocated outwardly or inwardly.

THe Thigh-bone or Hip when it is diſlocated outwardly, and not reſtored, after ſom time the pain is aſſwaged, and fleſh grow's about it, the head of the bone wear's it ſelf a new cavitie in the adjoining Hip, whereinto it betake's it ſelf, ſo that at the length the patients may go without a ſtaff, neither ſo deformed a leanneſs will waſte their leg. But if the luxation happen inwards, a greater leanneſs will befal them, by reaſon that the veſſels naturally run more inwardly, as *Galen* obſerv's in the diſlocation of the *Vertebræ* to the inſide; therefore it com's to paſs that they are more grievouſly oppreſſed: beſides the thigh-bone cannot wag or once ſtir againſt the ſhare-bone: wherefore if the bone thus diſlocated bee not reſtored to its joint again, then they muſt caſt their leg about as they walk, juſt as wee ſee oxen do. Wherefore the ſound leg whil'ſt they go, take's much leſs ſpace then the lame, becauſ this, whil'ſt it ſtirreth or mooveth, muſt neceſſarily fetch a compaſs about, but that performeth its motion in a right line. Beſides, whil'ſt the patients ſtand upon their lame leg to put forwards the ſound, they are forced to ſtand crooked, whereupon they are forced to ſtay themſelvs with a ſtaff that they fall not.

Ad ſent. 51. ſect. 3. de art.

Further-

Furthermore those who have this bone dislocated either backwards or outwards, so that it cannot bee restored, have the part it self grow stiff and hard; which is the cause why the ham may bee bended without great pain, and they may stand, and go upon the tops of their toes; besides also, when they desire to go faster, they are forced to stoop, and strengthen themselvs by laying their hand on their lame thigh at every step, both for that their lame leg is the shorter, as also becaus the whole weight of the bodie should not lie wholly or perpendicularly upon the joint or head of the thigh-bone. Yet in continuance of time, when they are used to it, they may go without any staff in their hands. Yet in the interim, the sound leg becom's more deformed in the composure and figure, becaus, whilst it succor's the opposite and lame leg by the firm standing on the ground, it bear's the weight of the whole bodie, in performance whereof the ham must necessarily now and then bend. But on the contrarie, when as the head of the thigh beeing dislocated inwards is not put into the joint, if the patient bee arrived at his full growth, after that the head of the bone hath made it self a cavitie in the neighboring bone wherein it may rest, hee may bee able to walk without a staff, becaus the dislocated leg cannot easily bee bended toward the groin or ham, and hee will sooner rest upon his heel then upon his toes. This kinde of dislocation if it bee inveterate, can never bee restored. And these things happen, when as the thigh-bone is dislocated inwards, or when the internal ligament which fasten's the dearticulation shall bee broken or relaxed. But the contrarie shall plainly appear if the dislocation shall happen to bee outwards; for then the lame leg becom's the shorter, becaus the head of the thigh flie's into a place higher then its cavitie, and the muscles of that part are contracted towards their original, and convulsively draw the bone upward together with them. The whole leg, together with the knee and foot looketh inwards, they cannot go upon their heels, but upon the setting on of the toes. The leg may bee bended, which it cannot bee in a dislocation of the thigh inwards, as *Paulus* shew's. Therfore wee must diligently observ that sentence of *Hippocrates* which is read with a negative, in these words: *Sed neque confiectere quemadmodum sanum crus possunt*, that they ought to bee read with an affirmative after this manner: *Sed confiectiere &c. quin & crus ipsum &c.* But now the lame leg will better sustain the weight of the bodie in an external, then in an internal dislocation; for then the head of the thigh is more perpendicularly subject to the whole weight of the bodie. Therefore when in the succes of time it shall by wearing have made it self a cavitie in the neighboring bone, which in time will bee confirmed, so that there will remain no hope of restoring the dislocation, nevertheles the patient shall bee able to go without a staff, for that then no sens of pain will trouble him; whence it follow's, that the whole leg also will becom les lean, for that going is les painful, neither are the vessels so much pressed as in that dislocation which is made inwardly.

Signs of the thigh-bone dislocated outwards.

Paul. Æg. lib. 6. c. 8. Hip. sent. 91 sect. 3. lib. de art.

CHAP XLII.

Of the thigh-bone dislocated forewards.

IT seldom happeneth that the thigh is dislocated forwards; yet when as it shall happen, it is by these signs. The head of the thigh lieth towards the share; whence the groins swell up, and the buttock on the contrarie is wrinkled and extenuated by reason of the contraction of the muscles; the patient cannot extend his leg without pain, no verily, not so much as bend it towards the groin, for the fore-muscle which ariseth from the hanch-bone is so pressed by the head of the thigh, that it cannot bee distended; neither can the ham bee bended with out very much paine. But the same leg is equall at the heel with the other leg, yet the patient cannot stand upon the setting on of the toes; therefore when hee is forced to go, hee toucheth the ground with his heel only, yea verily the sole of his foot is les inclined to the fore side, neither doth it seldom happen, that the urine, by this accident, is suppre'st; becaus the head of the thigh oppresse's the greater nerves from whence those arise which are carried to the bladder, which through the occasion of this compression is pained and inflamed by consent: now when inflammation shall seiz upon the *Sphinct*-muscle, the urine can scarcely flow out, for that it is hindered by the swelling.

Stopping of urine by reason of an internal dislocation of the thigh-bone.

CHAP. XLIII.

Of the Thigh-bone dislocated backwards.

SEldom also is the thighbone dislocated backwards, becaus the hind-part of the cavitie of the huckle-bone is deeper and more depressed than the fore; whence it is that the dislocation of the thigh to the inner part is more frequent then the rest. The patient can neither extend nor bend his leg by reason of the much compression and tension of the muscles which encompas the head of the thigh by this kind

Signs.

of luxation. But the pain is encreaſed when hee would bend his ham, for that then the muſcles are more ſtrongly extended. The lame leg is ſhorter than the ſound: when the Buttocks are preſſed, the head of the thigh is perceived hid amongſt the muſcles of that part, but the oppoſite groin is lax, ſoft, and depre'ſt with a manifeſt cavitie. The heel touche's not the ground, for that the head of the thigh is plucked back again by the muſcles of the buttocks amongſt which it lieth hid, but principally by that which is the larger, and which is ſaid to make as it were the pillow or cuſhion of the buttocks; for this is much more preſſed in this kinde of diſlocation then the reſt: whence it is, that the patient cannot bend his knee, becauſ the extenſion of the nervous production or large tendon which covers's the knee is ſo great. But if the patient will ſtand upon the foot of his luxated leg without a ſtaff, hee ſhall fall down backwards, for that the bodie is inclined to that part, the head of the thigh being not directly underneath for the propping or bearing up of the bodie; wherefore hee is forced to ſuſtain himſelf upon a crutch on his lame ſide. Haveing premiſed theſe things of the differences, ſigns, ſymptoms and prognoſticks, it now remaineth, that wee briefly deſcribe the different waies of reſtoreing them, according to the difference of the parts whither it is fallen. Firſt, you muſt place the patient upon a bench or table, groveling, or with his face upwards, or upon one ſide, laying ſom ſoft quilt or coverlid under him, that hee may lie the eaſier. Now you muſt place him ſo, that the part unto which the bone is flown, may be higher, but from whence it is fled, the lower. For if the thigh-bone bee diſlocated outwards or backwards, then muſt the patient bee laid groveling; if inwardly, upon his back; if forwards, then upon his ſide. Then muſt extenſion and impulſion bee made towards the cavitie, that ſo it may bee forced thereinto: but if the diſlocation bee freſh, and in a ſoft bodie, as a woman, childe, and ſuch like, whoſe joints are more lax, it ſhall not bee any waies needful to make great extenſion with ſtrong ligatures for the reſtoreing it; the Surgeon's hand ſhall ſuffice, or a liſt or towel caſt about it. In the interim the bone ſhall bee kep't faſt with compreſſes applied about the joint: then the Surgeon ſhall extend the thigh, takeing hold thereof above the knee, in a ſtraight line, and ſo ſet it directly againſt the cavitie, and then preſently thruſt it thereinto. For thus ſhall hee reſtore it, if ſo bee that in thruſtingit hee liſt up the head thereof ſomwhat higher, leſt the lips of the cavitie force it back, and hinder it from entring. Now becauſ unleſs there bee juſt extenſion, there can bee no reſtitution hoped for, it is far better in that part, that is, to extend it ſomwhat more than is neceſſarie, yet ſo, that you do not endanger the breaking of any muſcles, tendon or other nervous bodie. For that as *Hippocrates* write's, when as the muſcles are ſtrong and large, you may ſafely extend them, if ſo bee that you diſplace nothing by the force of the extenſion. If your hand will not ſuffice to make juſt extenſion, you muſt uſe the help of an Engine, ſuch as is our Pulley, faſtned to two poſts, ſo much of the rope beeing let forth, and drawn up again as ſhall ſuffice for the buſineſs in hand; in the performance whereof, it is fit that the patients friends abſent themſevs from this ſad ſpectacle, and that the Surgeon bee reſolute, and not deterred from his buſineſs by the lamentation, neither of the patient nor his friends. But for that wee write theſe things chiefly for the benefit of young practicioners, it ſeemeth meet, that haveing delivered theſe things in general, of reſtoring the thigh-bone, that wee run over theſe generalities in each particular, begining with that diſlocation which is made inwardly.

The general cure.

Sect. 2. lib. de fract.

CHAP. XLIV.

Of reſtoreing the Thigh-bone diſlocated inwards.

IT is fit to place the patient after the foreſaid manner, upon a table or bench, in the mid'it whereof ſhall ſtand faſtned a woodden pin of a foot's length, and as thick as the handle of a ſpade uſeth to bee; but it muſt bee wrapped about with ſom ſoft cloth, leſt the hardneſs hurt the buttocks, betwixt which it muſt ſtand, as wee read that *Hippocrates* did in the extenſion of a broken leg The wooden pin hath this uſe, to hold the bodie that it may not follow him that draweth or extendeth it; and that the extenſion beeing made as much as is requiſite, it may go between the *peritoneum* and the head of the diſlocated thigh. For thus there is no great need of counter-extenſion towards the upper parts; and beſides it helpeth to force back the bone into its cavitie, the help of the Surgeon concurring, who twining ſomwhiles to this, and otherwhiles to that ſide, doth direct the whole work. But when the extenſion hath need of counter-extenſion, then it is needful you have ſuch ligatures at hand, as wee have mentioned in the reſtoreing of a diſlocated ſhoulder, to bee drawn above the ſhoulder. One of theſe ſhall bee faſtned above the joint of the hip, and extended by a ſtrong man; another ſhall bee caſt above the knee by another with the like force. But if you cannot have a woodden pin, another ſtrong and like ligature ſhall bee put upon the joint directly at the hip, and held ſtiff by the hands of a ſtrong man, yet ſo that it my not touch the head of the thigh by preſſing it, for ſo it would

Sect. 2. lib de fract.

How to make extenſion and counter-extenſion in this kinde of fracture.

would hinder the restoring thereof. This manner of extension is common to four kindes of luxation of the thigh-bone. But the manner of forcing the bone into its cavitie must bee varied in each, according to the different condition of the parts whereunto the head incli-neth; to wit it must bee forced outwards if it bee fallen inwards, and contrarie in the rest, as the kinde of the dislocation shall bee. Som too clowniſh and ignorant knot-knitters fasten the lower ligature below the ankle, and thus the joints of the foot and knee are more extended then that of hip or huckle-bone, for they are neerer to the ligature, and consequently to the active force: but they ought to do otherwise; therefore in a dislocated shoulder you shall not fasten the ligatures to the hand or wrest, but above the elbow. But if the hands shall not bee sufficient for this work, then must you make use of engines. Wherefore then the patient being placed as is fit, and affected part firmly held, som round thing shall bee put into the groin, and the patient's knee, together with his whole leg shall bee drawn violently inwards, towards the other leg. And in the mean while the head of the thigh shall bee strongly forced towards the cavitie of the huckle-bone, and so at length restored, as the following figure shew's.

Ligatures made for extension must bee fastned neer the part to bee extended.

A figure which manifesteth the way of restoring the Thigh-bone dislocated inwards.

When the head of the Thigh by just extension is freed from the muscles wherewith it was infolded, and the muscles also extended that they may give way and yeeld themselvs more pliant, then must the rope bee somwhat slacked, and then you must also desist from extending, otherwise the restitution cannot bee performed, for that the stronger extension of the engine will resist the hand of the Surgeon, thrusting and forceing it into the cavitie. This precept must bee observed in the restoring of this and other dislocations. You shall know that the thigh is restored by the equalitie of the legs, by the free and painless extension and inflection of the lame leg. Lastly, by the application of agglutinative medicines (whereof wee have formerly spoken) the restored bone shall bee confirmed in its place; to which purpose ligation shall bee made, the ligature beeing first cast upon the place whereinto the head of the thigh fell, and thence brought to the opposite or sound side by the belly and loins. In the mean while the cavitie of the groin must bee filled with somwhat a thick bolster which may keep the head of the bone in the cavitie. Neither must you omit junks stretched down even to the ankles, as wee have observed in the fracture of the thigh. Then must both the thighs bee bound together, whereby the dislocated member may bee unmoovable, and more and more strengthned. Neither must this dressing bee loosed, untill four or five daies bee passed, unless peradventure the sudden happening of som other more grievous symptom shall perswade otherwise. To conclude, the patient must bee kept in his bed for the space of a month, that the relaxed muscles, nervs, and ligaments may have space to recover their former strength, otherwise, there is danger lest the bone may again fall out by the too forward and speedy walking upon it. For the site of the thigh it must be placed and kept in a middle figure, yet this middle figure consist's in the extension, not in the flexion, as it is demonstrated by *Hippocrates*, for that such a figure is accustomable to the leg.

A general precept.

Sect. 2. Lib. de fract.

CHAP. XLV.

Of restoreing the Thigh dislocated outwardly.

THe patient must bee placed groveling upon a table in this kinde of dislocation also, and ligatures as before, cast upon the hip and lower part of the thigh, then extension must bee

bee made downwards, and counter-extenſion upwards; then preſently the head of the bone muſt bee forced by the hand of the Surgeon into its place. If the hand bee not ſufficient for this purpoſe, our pulley muſt bee uſed, as the following figure ſheweth.

A figure which expreſſeth the manner of reſtoreing the thigh luxated outwards.

When it is that onely extenon ſerv's for the reſtoring the diſlocated Thigh.

This kinde of diſlocation is the eaſilieſt reſtored of all theſe which happen in the thigh or hip, ſo that I have diverſ times obſerved the head of the thigh to have been drawn back into its cavitie by the onely regreſs of the extended muſcles into themſelvs towards their originals, ſomwhiles with a noiſ or pop, otherwhiles without, which beeing don, laying a compreſs upon the joint, you ſhall perform all other circumſtances as before in an internal diſlocation.

CHAP. XLVI.

Of reſtoreing the Thigh diſlocated forwards.

When the Thigh is luxated forwards, the patient muſt bee laid upon his ſound ſide, and tied as wee have formerly delivered. Then the Surgeon ſhall lay a bolſter upon the prominent head of the bone, and have a care that his ſervant firmly hold it: then immediately juſt extenſion beeing made, hee ſhall with his hand force the bone into the cavitie; but if his hand will not ſerv, hee ſhall attempt it with his knee. Then to conclude, hee ſhall uſe the reſt of the things formerly mentioned to contain the reſtored bone.

CHAP. XLVII.

Of reſtoreing the Thigh diſlocated backwards.

The patient ſhall bee placed groveling upon a table or bench, and the member extended, as in the reſt, one ligature ſtretched from the groin, another from the knee; then the Surgeon ſhall endeavor to force back with his hand that which ſtand's up, and alſo to draw away the knee from the ſound leg. The bone thus placed and reſtored, the cure require's nothing elſ than to bee bound up and kept long in bed, leſt that the Thigh, if it ſhould bee moved, the nerv's beeing yet more looſ, might again fall out. For the thigh is in great danger of relapſ, for that the cavitie of the huckle-bone is onely depreſt, as far as it goe's in, and the burden of the hanging or adjoining thigh is heavie.

CHAP. XLVIII.

Of the diſlocation of the Whirl-bone of the knee.

The Whirl-bone of the knee may fall forth into the inner, outer, upper and lower part; but never to the hind-part, becauſ the bones which it cover's do not ſuffer it. To reſtore it, the patient muſt ſtand with his foot firmly upon ſom even place, and then the Surgeon muſt force and reduce it with his hands from the part into which it is preter-naturally

naturally ſlidden. When it ſhall bee reſtored, the cavitie of the ham ſhall bee filled up with bolſters ſo that hee may not bend his leg, for if it bee bended, there is no ſmal danger of the falling back of the whirl-bone. Then a caſe or box ſhall bee put about it, on the ſide eſpecially whereto it fell, beeing made ſomwhat flat and round reſembling the whirl-bone it ſelf, and it ſhall bee bound on with ligatures, and medicines ſo faſt that it may not ſtir a jot. After the part ſhall ſeem to have had ſufficient reſt, it is fit that the patient trie and accuſtom by little and little to bend his knee, until at length hee ſhall finde that hee may eaſily and ſafely moov that joint.

CHAP. XLIX.

Of the diſlocated Knee.

THe Knee alſo may bee diſlocated three manner of waies, that is, into the inner, outer, and hind-part, but very ſeldom towards the fore-ſide, and that not without ſom grievous and forcible violence; for the whirl-bone lying upon it, hinder's it from ſlipping out, and hold's it in. The other waies are eaſie, becauſ the cavitie of the leg-bone is ſuperficiarie aud very ſmooth, but the cavitie of the lower end of the thigh-bone is made in the manner of a ſpout or gutter, and beſides the head thereof is verie ſmooth and ſlipperie; but the whole joint is much more lax than the joint of the Elbow: ſo that as it may bee the more eaſily diſlocated, ſo may it the beter bee reſtored; and as it may bee the more eaſily, ſo may it bee the more ſafely diſlocated, for that inflammation is leſs to bee feared here, as it is obſerved by *Hippocrates*. Falls from high, leaping, and too violent runing are the cauſes of this diſlocation. The ſign thereof is the diſabilitie of bending or lifting up the leg to the thigh, ſo that the patient cannot touch his buttock with his heel. The diſlocation of the knee which is inwardly and outwardly, is reſtored with indifferent extenſion and forceing of the bones into their ſeats from thoſe parts whereunto they have fallen. But to reſtore a diſlocation made backwards, the patient ſhall bee placed upon a bench of an indifferent height, ſo that the Surgeon may bee behinde him who may bend with both his hands and bring to his buttocks the patients leg put between his legs. But if the reſtitution do not thus ſucceed, you muſt make a clew of yarn, and faſten it upon the mid'ſt of a ſtaff, let one put this into the cavitie of his ham, upon the place whereas the bone ſtand's out, and ſo force it forwards; then let another caſt a ligature of ſom three fingers bredth upon his knee, & draw it upwards with his hands, then preſently & at once they ſhal ſo bend & crook the lame leg that the heel thereof may touch his buttocks.

The differences.

Ad finem ſect. 3 de fract.

How to reſtore a knee diſlocated backwards.

CHAP. L.

Of a Knee diſlocated forwards.

BUt if the Knee bee diſlocated forwards (which ſeldom happen's) the patient ſhall bee placed upon a table and aconvenient ligation made aboov, and another cloſe beneath the knee. Then the Surgeon ſhall ſo long preſs down with both his hands the bone which is out of joint, until it ſhall return to its place again. To which purpoſe if the ſtrength of the hand wil not ſerv to make juſt extenſion each way you may make uſe of our engine, as you may perceiv by this following figure.

The cure.

A figure ſhewing the manner of reſtoreing a Knee diſlocated forwards.

You ſhall know that the bone is reſtored by the free and painleſs extenſion of the leg; then

then will there bee place for medicines, bolſters and ſtrengthening ligatures. In the mean ſpace the patient ſhall forbear going ſo long as the part ſhall ſeem to require,

CHAP. LI.

Of the ſeparation of the greater and leſſer Focile.

The joining of the leg and ſhin-bones.

THe *Fibula* or leſſer Focile is faſtned and adhere's to the *Tibia*, leg-bone, or greater Focile without any cavitie, above at the knee and below at the ankle. But it may bee pluck't or drawn aſide three manner of waies, that is, forwards, and to each ſide: this chance happen's when in going wee take no ſure footing, ſo that wee ſlip with our feet this way and that way as in a ſlipperie place, and ſo wreſt it inwards or outwards; for then the weight of our bodie lying open upon it, draw's the leg, as it were, in ſunder, ſo that the one Focile is diſlocated or ſeparated from the other. The ſame may happen by a fall from an high place, or ſom grievous and bruiſing blow: beſides alſo, their appendices are ſomtimes ſeparated from them. For the reſtoreing of all theſe into their proper places, it is fit they bee drawn and forced by the hand of the Surgeon into their ſeats: then ſhall they bee ſtraitly bound up, putting compreſſes to that part unto which the *Fibula* flew; beginning alſo your ligation at the very luxation, for the fore-mentioned reaſons. The patient ſhall reſt fortie daies, to wit, as long as ſhall bee ſufficient for the ſtrengthening of the ligaments.

The cure.

CHAP. LII.

Of the Leg-bone or greater Focile diſlocated and divided from the Paſtern-bone.

Differences and ſigns.

ALſo the Leg-bone is ſomtimes diſlocated and divided from the Paſtern-bone, as wel inwardly, as outwardly; which may bee known by the ſwelling out of the bone to this or that part; if it bee onely a ſubluxation or ſtrain, it may bee eaſily reſtored, by gently forceing it into the place again. After the bone ſhal bee reſtored, it ſhall bee kept ſo by compreſſes and fit deligation, by croſs and contrarie bindeing to the ſide oppoſite to that towards which the bone fell, that ſo alſo in ſom meaſure it may bee more and more forced into its place. In the mean time you muſt have a care that you do not too ſtraitly preſs the great and large tendon which is at the heel. This kinde of diſlocation is reſtored in fortie daies, unleſs ſom accident happen which may hinder it.

CHAP. LIII.

Of the diſlocation of the Heel.

Cauſes and differences.

WHoſoever leaping from an high place have fallen very heavie upon their heel, have their heel diſlocated and divided from the paſtern-bone. This diſlocation happen's more frequently inwardly than outwardly, becauſ the prominencie of the leſſer Focile embrace's the paſtern-bone; whence it is, that there it is more ſtraitly and firmly knit. It is reſtored by extenſion and forceing it in, which will bee no very difficult matter, unleſs ſom great defluxion or inflammation hinder it. For the bindeing up, it muſt beee ſtraiteſt in the part affected, that ſo the blood may bee preſſed from thence into the neighboring parts; yet uſing ſuch a moderation, that it may not bee painful, nor preſs more ſtraitly than is fit, the nervs and groſs tendon which run's to the heel. This diſlocation is not confirmed before the fortieth day, though nothing happen which may hinder it. Yet uſually it happeneth that many ſymptoms enſue by the vehemencie of the contuſion. Wherefore it will not be amiſs to handle them in a particular chapter.

The cure.

CHAP. LIV.

Of the Symptoms which follow upon the contuſion of the Heel.

Why blood-letting neceſſarie in the fracture of a heel.

Hip. ſect. 3. de fracturis.

IT happeneth by the vehemencie of this contuſion, that the veins and arteries do as it were vomit up blood both through the ſecret paſſages of their coats, as alſo by their ends or orifices, whence an *Ecchymoſis* or blackneſs over all the heel, pain, ſwelling, and other the like enſue, which implore remedies and the Surgeon's help, to wit, convenient diet, and drawing of blood by opening a vein, (of which though *Hippocrates* make's no mention, yet it is here requiſite by reaſon of the Feaver and inflammation) and if need require, purgation; principally ſuch as may divert the matter by cauſing vomit, and laſtly, the

the application of local medicines, chiefly such as may soften and rarifie the skin under the heel, otherwise usually hard and thick (such as are fomentations of warm water and oil) so that divers times wee are forced to scarifie it with a lancet, shunning the quick flesh. For so at length the blood poured forth into the part, and there heaped up, is more easily attenuated, and at length resolved. But these things must all be performed before the inflammation seiz upon the part, otherwise there will be danger of a convulsion. For the blood, when it fall's out of the vessels, readily putrefies, by reason the densitie of this part hinder's it from ventilation & dispersing to the adjacent parts. Hereto may be added, that the large and great tendon which cover's the heel, is endued with exquisite sens, & also the part it self is on everie side spred over with many nervs. Besides also there is further danger of inflammation by lying upon the back and heel, as wee before admonished you in the Fracture of a leg. Therefore I would have the Surgeon to bee heer most attentive and diligent to perform these things which we have mentioned, lest by inflammation a Gangrene and Mortification (for heer the sanious flesh presently fall's upon the bone) happen together with a continued and sharp Fever, with trembling, hicketting and raveing. For the corruption of this part first by contagion assail's the next, and thence a Fever assail's the heart by the arteries prested and growing hot by the putrid heat, and by the nervs and that great and notable tendon made by the concourse of the three muscles of the calf of the leg, the muscles, brain and stomach are evilly affected and drawn into consent, and so caus convulsions, raveing and a deadlie hicketting.

Why the heel is subject to inflammation.

Gal. ad sent. 23. sect. 2. lib. de fract.

CHAP. LV.

Of the dislocated Pastern, or Ancle-bone.

THe *Astragalus* or Pastern bone may bee dislocated and fall out of its place to everie side. Wherefore when it fall's out towards the inner part, the sole of the foot is turned outwards, when it flie's out to the contrarie, the sign is also contrarie; if it bee dislocated to the foreside, on the hinde side the broad tendon coming under the heel is hardened and distended. but if bee luxated backwards, the whole heel is as it were hid in the foot: neither doth this kinde of dislocation happen without much violence. It is restored by extending it with the hands, and forcing it into the contrary part to that from whence it fell. Beeing restored it is kept so by application of medicines and fit ligation. The patient must keep his bed long in this case, lest that bone which sustain's and bear's up the whole bodie, may again sink under the burden, and break out, the sinews beeing not well knit and strengthened.

Sign.

Cure.

CHAP. LVI.

Of the dislocation of the In-step and back of the foot.

THe bones also of the In-step and back of the foot may bee luxated, and that either upwards or downwards, or to one side, though seldom sidewise, for the reason formerly rendred, speaking of the dislocation of the like bones of the hand. If that they stand upwards, then must the patient tread hard upon som plain or even place, and then the Surgeon by pressing them with his hand shall force them into their places; on the contrary, if they stand out of the sole of the foot, then must you pres them thence upwards, and restore each bone to its place. They may bee restored after the same manner if they bee flown out to either side. But you must note, that although the Ligatures consist but of one head in other dislocations, yet here *Hippocrates* would have such used as have two heads, for that the dislocation happen's more from below upwards, or from above downwards, then sidewise.

Cure.

Sent. 14. sect. 2. lib. de fract.

CHAP. LVII.

Of the dislocation of the Toes:

NOw the Toes may bee four waies dislocated, even as the fingers of the hand; and they may bee restored just after the same manner, that is, extend them directly forth, and then force each joint into its place, and lastly, binde them up as is fitting. The restitution of all them is easie, for that they cannot far transgres their bounds. To conclude, the bones of the feet are dislocated and restored by the same means as those of the hands, but that when as any thing is dislocated in the foot, the patient must keep his bed; but when any thing is amiss in the hand, hee must carrie it in a scarf. The patient must rest twenty daies, that is, until hee can firmly stand upon his feet.

The differences.

Cure.

CHAP.

CHAP. LVIII.

Of the ſymptoms, and other accidents which may befal a broken or diſlocated member.

MAnie things may befal broken or diſlocated members by the means of the fracture or diſlocation; ſuch as are bruiſes, great pain, inflammation, a fever, impoſtume, gangrene, mortification, ulcer, *fiſtula*, and *atrophia*, all which require a skilfull and diligent Surgeon for their cure. A contuſion happen's by the fall of ſom heavie thing upon the part, or by a fall from high, whence follow's the effuſion of blood poured out under the skin: which if it bee poured forth in great plentie, muſt bee ſpeedily evacuated by ſcarification, and the part eaſed of that burthen, leſt it ſhould thence gangrenate. And by how much the blood ſhall appear more thick, and the skin more denſ, by ſo much the ſcarification ſhall be made more deep. You may alſo for the ſame purpoſe applie Leeches.

Remedies for a contuſion.

Concerning pain wee formerly ſaid, that it uſually happen's by reaſon that the bones are mooved out of their places, whence it happeneth that they becom troubleſom to the muſcles and nervs, by pricking and preſſing them. Hence enſue inflammations, as alſo impoſtumation and a fever, oft times a gangrene, and in concluſion a mortification corrupting and rotting the bones; otherwhiles a ſinuous ulcer or *fiſtula*. But an *atrophia* and leanneſs ariſeth by the ſloth and idleneſs of the member decaying all the ſtrength thereof, and by too ſtraight ligation intercepting the paſſages of the blood, otherwiſe readie to fall and flow thither.

What may happen by pain.

Now the leanneſs which is occaſioned by too ſtraight ligation receive's cure by the ſlackning of the ligatures wherewith the member was bound. That which proceed's from idleneſs, is helped by moderate exerciſe, by extending, bending, lifting up, and d-preſſing the member, if ſo bee that hee can away with exerciſe. Otherwiſe hee ſhall uſe frictions and fomentations with warm water. The frictions muſt be moderate in hardneſs and gentleneſs, in length and ſhortneſs. The ſame moderation ſhall be obſerved in the warmneſs of the water, and in the time of fomenting. For too long fomenting reſolv's the blood that is drawn. But that which is too little or ſhort a ſpace draw's little or nothing at all: after the fomentation, hot and emplaſtick medicines made of pitch, turpentine, *euphorbium*, pellitorie of Spain, ſulphur, and the like, ſhall bee applied. They ſhall bee renued everie day more often or ſeldom, as the thing it ſelf ſhall ſeem to require.

Remedies for the leanneſs or *Atrophia* of any member.

What meaſure to bee uſed in fomenting.

Theſe medicines are termed *Dropaces*, whoſe form is thus: ℞ *picis nigræ, ammoniaci, bdelii, gummi elemi in aquâ vitæ diſſolutorum an.* ℥ii. *olei laurini* ℥i. *pulveris piperis, zinziberis, granorum paradiſi, baccarum lauri & juniperi, an.* ʒii. *fiat emplaſtrum ſecundùm artem, extendatur ſuper alutam.* It is alſo good to binde about the oppoſite ſound part with a ligature, yet without pain; as if the right arm ſhall decay for want of nouriſhment, the left ſhall bee bound, beginning your ligation at the hand, and continuing it to the arm-pit. If this miſchance ſhall ſeiz upon the right leg, then the left ſhall bee ſwathed up from the ſole of the foot to the groin. For thus a great portion of the blood is forced back into the *vena cava*, or hollow vein, and from this being diſtended and over full, into the part affected and gapeing with the veſſels almoſt emptie; beſide alſo it is convenient to keep the ſound part in reſt, that ſo it may draw the leſs nouriſhment, and by that means there will bee more ſtore to refreſh the weak part.

A *dropax*.

Binding of the ſound part oppoſite to the emaciated.

Som wiſh alſo to binde up the decaying member with moderate ligation; for thus, ſay they, the blood is drawn thither: for when as wee intend to let blood by opening a vein with a lancet, wee binde the arm. Alſo it is good to dip it into water ſomwhat more then warm, and hold it there until it grow red, and ſwell; for thus blood is drawn into the veins, as they finde, which uſe to draw blood of the *ſaphena* and *ſalvatella*. Now, if when as theſe things and the like bee don, the lame part grow's hot, red and ſwollen, then know that health is to bee hoped for; but if the contrarie happen, the caſe is deſperate: wherefore you need attempt nothing further.

How to binde up the emaciated part.

Furthermore, there is ſomtimes hardneſs left in the joints, after fractures and diſlocations are reſtored. It is fit to ſoften this, by reſolving the contained hnuor by fomentations, liniments, cataplaſms, emplaſters made of the roots of marſh-mallows, brionie, lillies, line ſeed, fenugreek ſeed, and the like, and alſo of gums diſſolved in ſtrong vineger, as *ammoniacum, bdelium, opopanax, labdanum, ſagapenum, ſtyrax liquida*, and *adeps anſerinus, gallinaceus, humanus, oleum liliorum*, and the like. Alſo you muſt wiſh the patient to moov the part ever now and then, everie day, yet ſo, that it bee not painful to him, that ſo the pent up humor may grow hot, bee attenuated, and at length diſcuſſed, and laſtly, the part it ſelf reſtored as far as art can perform it; for oft-times it cannot bee helped any thing at all. For if the member bee weak and lame, by reaſon that the fracture happened neer the joint, for the reſidue of his life the motion thereof uſeth to bee painful and difficult, and oft-times none at all, eſpecially if the *callus*, which grow's there, bee ſomwhat thick and great; and laſtly, if the joint it ſelf ſhall bee contuſed and broken by the ſtroke, as it oft-times happen's in wounds made by gun-ſhot.

Signs that an *Atrophia* is curcable.

OF

Of diverſ other PRETER-NATURAL AFFECTS, whoſe cure is commonly performed by Surgerie.

THE SEVENTEENTH BOOK.

CHAP. I.

Of an Alopecia, *or the falling away of the hairs of the head.*

AN *Alopecia* is the falling away of the hair of the head, and ſomtimes alſo of the eie-brows, chin and other parts; the French commmonly call it the *Pelade*: Phyſicians term it the *Alopecia*, for old Foxes (ſubject, by reaſon of their age to have the ſcab) are troubled oft-times with this diſeaſ. This affect is cauſed either through defect of nouriſhment fit to nouriſh the hairs, as in old age through want of the radical humiditie, or by the corruption of the alimentarie matter of the ſame, as after long Fevers, in the *Lues venerea*, Leproſie, the corruption of the whole bodie and all the humors, whence follow's a corruption of the vapors and fuliginous excrements; or elſ by the vitious conſtitution of pores in the skin in raritie, and conſtriction or denſitie, as by the too much uſe of hot ointments made for coloring the hair, or ſuch as are uſed to take off hair, therefore called *Depilatoria*, or by the burning of the skin, or loſs thereof, haveing a ſcar in ſtead thereof, by reaſon of whoſe denſitie the hair cannot ſpring out; as by too much laxitie the fuliginous matter of the hair ſtaie's not, but preſently vaniſheth away. The *Alopecia* which com's by old age, a conſumption, burn-baldneſs, leproſie, a ſcald head, is incureable: that which admit's of cure, the cauſ beeing taken away, is helped. Wherefore if it proceed from the corruption of humors, let a Phyſician bee called, who, as hee ſhall think it fit, ſhall appoint diet, purgeing and phlebotomie. Then the Surgeon ſhall ſhave off the hair which is remaining, and ſhall firſt uſe reſolving fomentations, applie Leeches and Horns to digeſt the vitious humor which is under the skin, then ſhall hee waſh the head to take away the filth with a Lee wherein the roots of Orris and Aloës have been boiled. Laſtly, hee ſhall uſe both attractive fomentations and medicines for to draw forth the humor which is becom laudable in the whole bodie by the benefit of diet fitly appointed. But if the *Alopecia* ſhall happen through defect of nouriſhment, the part ſhall bee rubbed ſo long with a courſ linnen cloth, or a fig-leaf, or onions until it wax red; beſides alſo the skin ſhall bee pricked in many places with a needle, and then ointments applied made of *Labdanum*, pigeons dung, ſtaves-acre, oyl of bayes, turpentine and wax, to draw the blood and matter of the hairs. If the hair bee loſt by the *Lues venerea*, the patient ſhall bee anointed with quick-ſilver to ſufficient ſalivation. To couclude, as the cauſes of this diſeaſ ſhall bee, ſo muſt the remedies bee fitted which are uſed.

Gal. c. 2. lib. 1. de comp. med. ſecun. locos.

The cauſ.

What *Alopecia* uncureable.

What cureable, and how.

" σταφὶς ἄγρια

CHAP. II.

Of the Tinea, *or Scald-head.*

THe *Tinea* (let mee ſo term it in Latine, whil'ſt a fitter word may bee found) or a Scald-head, is a diſeaſ poſſeſſing the muſculous skin of the head or the hairie ſcalp, and eating thereinto like a moth. There are three differences thereof; the firſt is called by *Galen ſcalie or bran-like*, for that whil'ſt it is ſcratched it caſt's manie bran-like ſcales: ſom Practitioners term it *a drie ſcall*, becauſ of the great aduſtion of the humor cauſing it. Another is called *Ficoſa*, *a fig-like ſcall*, becauſ when it is deſpoiled of the cruſt or ſcab which is yellow, there appear's grains of quick and red fleſh, like to the inner ſeeds or grains of figs, and caſting out a bloodie matter. *Galen* name's the third *Achor*, and it is alſo vulgarly termed the *corroſive or ulcerous ſcall*, for that the many ul-

Lib. 1. de comp. med. ſect. locos.

cers

cers where with it abound's are open with manie ſmall holes flowing with liquid *ſanies* like the waſhing of fleſh, ſtinking, corrupt and carrion-like, ſomwhiles livid, ſomwhiles yellowiſh. Theſe holes, if they bee ſomwhat larger, make another difference which is called *Cerion* or *Favoſa*, (that is, like a honie-comb) becauſ as *Galen* think's, the matter which floweth from theſe, reſembleth honie in color and conſiſtence. They all proceed of an humore which is more or leſs vitious, for a leſs corrupt humor cauſeth a ſcalie, a more corrupt; the fig-like, but the moſt corrupt produceth the ulcerous. If it ſhall happen to an infant by reaſon of the fault and contagion of the nurſ, or elſ preſently after it is born, it ſcarce admit's of cure; neither muſt wee attempt that, before the childe com to that age that hee may bee able to endure the cure and medicines. But you may in the mean while applie the leavs of Colworts or Beets beſmeared with freſh butter, or other gentle medicine haveing a facultie to mollifie and open the paſſage for the ſhut-up matter. Thoſe who are of ſufficient age to away with medicine, may bleed, purge, bathe according to art by the advice of a Phyſician. For local medicines in a ſcalie ſcall, ſoftening and diſcuſſing fomentations ſhall bee appointed, made of the roots of marſh-Mallows, Lillies, Docks, Sorrel boiled in lee with a little vineger added thereto. The head ſhall bee twice in a day fomented with ſuch a decoction, and on the ſixth day the hair beeing ſhaven off, it ſhall bee ſcarified, and then leeches & horns put to it ſo ſcarified. Then it ſhal bee forthwith anointed with oyl of ſtaves-acre mixed with black ſope, both to draw and repreſs the malignitie of the humor impa'ct in the part. You may alſo uſe the following medicine even to the perfect cure of the diſeaſ, as that which is much commended in this kinde of diſeaſ by *Vigo*, *Gordonius* and *Guido*; it is thus made. ℞ *elleb. albi & nigri, atrament. auripigmenti, litharg yri auri, calcis vivæ, vitriol. alum. galla. fulig. ciner. fæcis vini albi, an* ℥ ß. *argenti vivi extincti,* ʒiii. *æruginis æris* ʒii. *fiat pulvis qui incorporetur cum ſucco boraginis, ſcabioſæ, fumariæ, oxylapathi, aceti, an. quart.* i. *olei antiqui lib.* i. *bulliant uſque ad conſumpt. ſuccorum, in fine decoctionis cineres ponantur, addendo picis liquidæ* ℥ ß. *ceræ quantum ſufficit, fiat unguentum:* Theſe autors teſtifie that this will heal any kinde of ſcall. Certainly none can diſ-allow of it who well conſidereth the ingredients and compoſure thereof.

A cruſtie alſo or fig-like ſcall ſhall bee ſo long fomented with the preſcribed fomentation, until the cruſts or ſcabs fall off, yet there is nothing ſo good and effectual as Creſſes beaten or fried with hog's ſuet. For it will make it fall off in the ſpace of four and twentie hours, beſides, if it bee continued it will heal them throughly, as I have known by experience, and reaſon alſo ſtand's therewith; for according to *Galen*, Creſſes are hot and drie. When the cruſts ſhall bee fallen away, the parts affected ſhall bee anointed with the formerly preſcribed ointment. I have cured manie with a little oyl of vitriol, and ſomtimes alſo with *Ægyptiacum* made ſomwhat more ſtrong then ordinarie. But if the root of the hairs appear rotten, they ſhall bee plucked out one by one; yet if ſuch putrefaction ſhall poſſeſs the whole hairie ſcalp, and trouble all the roots of the hair, that you may pluck them out the more readily, and with leſs pain, you may beſmear a cotten-cloth on the rougher ſide with this following medicine. ℞ *picis nigræ* ʒvi. *picis ref.* ʒii. *pul. viridis æris, & vitriol. rom. an.* ʒi. *vel* ℥ ß *ſulphur. viv.* ℥ ß. *coquantur omnia ſimul in aceti acerrimi quantitate ſufficiente, fiat medicamentum ad uſum:* let it bee applied to the head, and remain on for two daies; then let it bee quickly and forcibly plucked away againſt the hair, that ſo the hairs ſticking to the plaiſter may by that means bee plucked away therewith: you ſhall uſe this medicine ſo long as need ſhall ſeem to require.

For the third kinde of Scall which is termed a Corroſive or Ulcerous, the firſt indication is to cleanſ the ulcers with this following ointment. ℞ *unguenti enulati cum mercurio duplicato, ægyptiaci, an.* ʒiii. *vitriol. albi in pulverem redacti* ʒi. *incorporentur ſimul, fiat unguentum ad uſum*; alſo you may uſe the formerly deſcribed ointment. But if any pain or other accident fall out, you muſt withſtand it by the aſſiſtance and direction of ſom good Phyſician; verily theſe following medicines againſt all kindes of Scalls have been found out by reaſon, and approoved by uſe. ℞ *Camphur.* ℥ ß. *alum. rocb. vitriol. vir. æris, ſulph. vivi, fulig. forn. an.* ʒvi. *olei amygd. dulcium & axungiæ porci, an.* ʒii. *incorporentur ſimul in mortario, fiat unguentum.* Som take the dung which lieth rotting in a ſheep-fold; they uſe that which is liquid, and rub it upon the ulcerated places, and lay a double cloth dipped in that liquor upon it. But if the patient cannot bee cured with all theſe medicines, and that you finde his bodie in ſom parts thereof troubled in like ſort with cruſtie ulcers, I would wiſh that his head might bee anointed with an ointment made of *Axungia, argentum vivum*, and a little *Sulphur*, and then fit ſom *emplaſtrum Vigonis cum mercurio* into the faſhion of a cap; alſo ſom plaiſters of the ſame may bee applied to the ſhoulders, thighs and legs, and ſo let him bee kept in a verie warm chamber, and all things don as if hee had the *Lues venerea*. This kinde of cure was firſt (that I know of) attempted by *Simon Blanch* the King's Surgeon, upon a certain young man, when as hee in vain had diligently tried all other uſual medicines. A ſcalled head oft-times appeareth verie loathſom to the eie, caſting forth virulent and ſtinking *ſanies*; at the firſt it is hardly cured, but being old, far more difficultly. For diverſ times it breaketh out afreſh, when you think it kill'd, by reaſon of the impreſſion of the malign putrefaction remaining in the part, which wholly corrupt's the temper thereof. Moreover, oft-times beeing healed, it hath left an

Alopecia

Cap. 8. lib. citati.

The cure.

For a ſcalie ſcall.

An ointment for a ſcolled head.

The cure of a cruſtie ſcall.

A poultis of Creſſes.

Lib. 7. ſimpl.

A plaiſter to pluck away the hair at once.

The cure of an ulcerous ſcall.

A contumacious ſcall muſt bee cured as wee cure the *Lues venerea*.

Alopecia behinde it, a great shame to the Surgeons. Which is the reason, that most of them judg it best to leav the cure thereof to Empericks and women.

CHAP. III.

Of the Vertigo, *or giddiness.*

What the *Vertigo* is, and the causes thereof.

THe *Vertigo* is a sudden darkning of the eies and sight by a vaporous and hot spirit which assendeth to the head by the sleepie arteries, and fil's the brain, disturbing the humors and spirits which are contained there, and tossing them unequally, as if one ran round, or had drunk too much wine. This hot spirit oft-times riseth from the heart upwards by the internal sleepie arteries to the *Rete mirabile*, or wonderful net; otherwhiles it is generated in the brain it self, beeing more hot then is fitting; also it oft-times ariseth from the stomack, spleen, liver and other entrals beeing too hot. The sign of this disease is the sudden darkning of the sight, and the closing up as it were of the eies, the bodie beeing lightly turned about, or by looking upon wheels runing round, or whirle-pits in waters, or by looking down anie deep or steep places. If the original of the disease proceed from the brain, the patients are troubled with the head-ach, heavines of the head, and nois in the ears, and oft-times they lose their smell. *Paulus Ægineta* for the cure bid's us to open the arteries of the temples. But if the matter of the disease arise from som other place, as from som of the lower entrals, such opening of an arterie little availeth. Wherefore then som skilful Physitian must bee consulted with, who may give directions for phlebotomie, if the original of the disease proceed from the heat of the entrals; by purging, if occasioned by the foulnes of the stomack. But if such a *Vertigo* bee a critical symptom of som acute disease affecting the *Crisis* by vomit or bleeding, then the whole busines of freeing the patient thereof must bee committed to nature.

The Signs.

Lib.6.

A critical *Vertigo*.

CHAP. IV.

Of the Hemicrania, *or Megrim.*

THe *Megrim* is properly a disease affecting the one side of the head, right, or left. It somtimes passeth no higher then the temporal muscles, otherwhiles it reacheth to the top of the crown. The caus of such pain proceedeth either from the veins and external arteries, or from the *meninges*, or from the verie substance of the brain or from the *pericranium*, or the hairie scalp covering the *pericranium*, or lastly, from putrid vapors arising to the head from the ventricle, womb, or other inferior member. Yet an external caus may bring this affect, to wit, the too hot or cold constitution of the encompassing air, drunkennes, gluttonie, the use of hot and vaporous meats, som noisom vapor or smoak, as of Antimonie, quick-silver, or the like, drawn up by the nose, which is the reason that gold-smiths, and such as guild metals are commonly troubled with this disease. But whencesoever the caus of the evil proceedeth, it is either a simple distemper, or with matter: with matter, I say, which again is either simple or compound. Now, this affect is either alone, or accompanied with other affects, as inflammation and tension. The heavines of head argue's plentie of humor; pricking, beating and tension shew's that there is a plentie of vapors mixed with the humors, and shut up in the nervous, arterious, or membranous bodie of the head. If the pain proceed from the inflamed *meninges*, a fever followeth thereon, especially, if the humor causing pain do putrefie. If the pain bee superficiarie, it is seated in the *pericranium*. If profound, deep and piercing to the bottom of the eies, it is an argument that the *meninges* are affected, and a feaver ensue's, if there bee inflammation, and the matter putrefie; and then oft-times the tormenting pain is so great and grievous, that the patient is afraid to have his head touched, if it bee but with your finger, neither can hee away with anie nois, or small murmuring, nor light, nor smels however sweet, no nor the fume of Wine. The pain is somtimes continual, otherwhiles by fits. If the caus of the pain proceed from hot, thin and vaporous blood, which will yeeld to no medicines, a verie necessarie, profitable and speedie remedie may bee had by opening an arterie in the temples, whether the disease proceed from the internal or external vessels. For, hence alwaies ensueth an evacuation of the conjunct matter, blood and spirits. I have experimented this in manie, but especially in the Prince de la *Roche-sur-yon*. His Physicians, when hee was troubled with this grievous Megrim, were *Chaplain*, the King's, and *Castellane* the Queen's chief Physicians, and *Lewes Duret*, who notwithstanding could help him nothing by blood-letting, cupping, bathes, frictions, diet or anie other kinde of remedie either taken inwardly or applied outwardly. I beeing called, said, that there was onely hope one way to recover his health, which was to open the arterie of the temple in the same side that the pain was; for I thought it probable, that the caus of his pain was not contained in the veins, but in the arteries, in which

The differences.

In what kinde of *Megrim* the opening of an Arterie is good.

A Historie.

which caſe by the teſtimonie of the antients, there was nothing better then the opening or bleeding of an arterie, whereof I have made trial upon my ſelf to my great good. When as the Phyſicians had approoved of this my advice, I preſently betake my ſelf to the work, and chooſ out the arterie in the pained temple, which was both the more ſwoln and beat more vehemently then the reſt. I open this, as wee uſe to do in the bleeding of a vein, with one inciſion, and take more then two ſawcers of blood flying out with great violence, and leaping; the pain preſently ceaſed, neither did it ever moleſt him again. Yet this opening of an Arterie is ſuſpected by manie, for that it is troubleſom to ſtay the guſhing forth blood, and cicatrize the place, by reaſon of the denſitie, hardneſs and continual pulſation of the arterie; and laſtly, for that when it is cicatrized there may bee danger of an *Aneuriſma*. Wherefore they think it better firſt to divide the skin, then to ſeparate the arterie from all the adjacent particles, and then to binde it in two places; and laſtly divide it, as wee have formerly told you muſt beee don in *Varicks*. But this is the opinion of men who fear all things where there is no cauſ; for I have learn't by frequent experience that the apertion of an arterie, which is performed with a Lancet, as wee do in opening a vein, is not at all dangerous; and the conſolidation or healing is ſomhat ſlower then in a vein, but yet will bee don at length, but that no flux of blood will happen, if ſo bee that the ligation be fitly performed, and remain ſo for four daies with fitting pledgets.

No danger in opening an arterie.

CHAP. V.

Of certain affects of the Eies, and firſt of ſtaying up the upper eie-lid when it is too lax.

Differences.

OF the diſeaſes which befal the eies, ſom poſſeſs the whole ſubſtance thereof, as the *Ophthalmia*, a *Phlegmon* thereof: others are proper and peculiar to ſom parts thereof, as that which is termed *Gutta ſerena* to the optick nerv. Whence *Galen* made a threefold difference of the diſeaſes of the eies, as that ſom happened to the eie by hurting or offending the chief organ thereof; that is the cryſtalline humor; others by hindering the animal facultie, the chief cauſer of ſight, from entring into them; and laſtly, other ſom by offending the parts ſubſervient to the prime organ or inſtrument. Now of all theſe diſeaſes, the eie hath ſom of them common with the other parts of the bodie, ſuch as are an ulcer, wound, *Phlegmon*, contuſion and the like: other ſom are peculiar and proper to the eie, ſuch as are the *Egilops*, *Cataracta*, *Glaucoma*, and diverſ others of this kinde. Som have their upper eie-lid fall down, by reaſon that the upper skin thereof is relaxed more then is ſufficient to cover the eie, the griſtle in the mean while not relaxing it ſelf together therewith. Hence proceed's a double trouble; the firſt, for that the eie cannot bee eaſily opened; the other, becauſ the hairs of the relaxed eie-lid run in towards the eie, and becom troubleſom thereto by pricking it. The cauſ of ſuch relaxation is either a particular palſie of that part, which is frequent in old people, or the defluxion or falling down of a wateriſh humor, and that not acrid or biteing; which appear's by this, that thoſe who are thus affected have a rank of hairs growing under the natural rank, by reaſon of aboundance of heaped-up humor, as it is moſt probable. For thus a wet and mariſh ground hath the greateſt plenty of graſs. Now if this ſame humor were acrid, it would cauſ an itching, and conſequently becom troubleſom to the patient, and it would alſo fret in ſunder and deſtroy the roots of the other hairs, ſo farre it is from yeelding matter for the preternatural generation of new. It is fit before you do any thing for the cure, that you mark with ink the portion there of which is ſuperfluous, and therefore to bee cut away, leaſt if you ſhould cut off more then is requiſite, the eye-lid ſhould remain turned up, and ſo cauſ another kinde of affect, which the antients have called *Eſtropion*. Then the eie beeing covered, take and lift up with your fingers the middle part of the skin of the eie-lid, not takeing hold of the griſtle beneath it, and then cut it athwart, takeing away juſt ſo much as ſhall bee neceſſarie to make it as it were natural; laſtly, join the lips of the wound together with a ſimple ſuture of three or four ſtitches, that ſo it may bee cicatrized; for the cicatrization reſtrain's the eie-lid from falling down ſo looſly, at leaſt ſom part thereof beeing taken away. There ought to bee ſom meaſure and heed taken in the amputation, otherwiſe you muſt neceſſarily run into the one or other inconvenience, as if too much bee cut away, then the eie will not bee covered; if too little: then you have don nothing, and the patient is troubled to no purpoſe. If there ſhall bee manie hairs grown preternaturally, you ſhall pluck them away with an inſtrument made for the ſame purpoſe; then their roots ſhall bee burned with a gentle cauterie, the eie beeing leſt untouch't, for a ſcar preſently ariſeing will hinder them from growing again.

Paul. Ægin lib. 8. cap. 6.

The cauſ.

The cure.

CHAP.

CHAP. VI.

Of Lagophthalmus, *or the Hare-eie.*

SUch as have their eie-lids too short, sleep with their eies open, for that they cannot bee covered by the too short skin of the eie-lids. the Greeks term this affect, λαγόφθαλμος. The cause is either internal or external: internal, as by a Carbuncle, Impostume, or Ulcer; external, as by a wound made by a sword, burn, fall, and the like. If this mishap proceed by reason of a cicatrization, it is cureable, if so that the short eie-lid bee of an indifferent thickness. But if it have been from the first conformation, or by som other means, whereby much of the substance is lost, as that which happen's by burning, and a carbuncle, then it is uncureable. For the cure, you shall use relaxing and amollient fomentations, then the skin shall bee divided above the whole scar, in figure of an half moon, with the horns looking downwards. Then the edges of the incision shall bee opened, and lint put into the middle thereof, that so it may hinder the lips from joyning together again. Then shall you apply a plaster upon the lint, and so binde up the part with a fitting ligature, that may somwhat press upon the whole eie, lest it should lift it self somwhat upwards again, and so return into its ancient, but not natural figure. But in cutting the skin, you must take care that your incision harm not the gristle; for if it bee cut, the eie-lid fall's down, neither can it bee afterwards lifted up. But now for the lower eie-lid: it is subject to sundrie diseases, amongst which there is one which answereth in proportion to that, which wee late mentioned, which is, when as it is lifted upwards little or nothing, but hang's and gape's, and cannot bee joyned with the upper, and therefore it doth not cover the eie, which affect is familiar to old people; it is called *Ectropion*, and it may bee helped by means formerly delivered.

Paulus Ægin. lib. 6. cap. 10.

The cure.

Ectropion, or the turning up, or out of the eie-lid.

CHAP. VII.

Of the Chalazion, *or Hail-stone, and the* Hordeolum, *or Barly-corn of the eie-lids.*

THe *Chalazion* is a round and cleer pimple, which grow's upon the upper eie-lid; it is also moovable, and may bee stirred this way and that way with your fingers. The Latines call it *Grando*, for that it resemble's a hail-stone. Another pimple not much like this grow's somtimes upon the verges of the eie-lids above the place of the hairs. It is termed *Hordeolum*, by reason of the similitude it hath with a barlie-corn. The matter of these is contained in its proper cist or skin, and therefore is hardly brought to suppuration. At the first begining it may bee resolved and discussed. But when as it is once grown and concrete into a plaster or stone-like hardness, it is scarce cureable. Wherefore it is best to perform the cure by opening them, that so the contained matter may flow, or bee pressed forth. If the pimple or swelling bee small, then thrust it through with a needle and thread, and leav the thread therein of such length, that you may fasten the ends thereof with a little of the emplaster called *Gratia Dei*, like glue to the fore-head, if it be on the upper eie-lid; or to the cheeks, if on the lower. You must draw through a fresh one every second daie, as is usually done in chirurgicall setons. For thus at length the swelling will bee destroied, and made plain.

Paul. cap. 6. lib. 6.

The cure.

CHAP. VIII.

Of the Hydatis, *or fatness of the eie-lids.*

THe *Hydatis* is a certain fattie substance, like a piece of fat seated and lying under the skin of the upper eie-lid. It is a diseas incident to children, who are of a more humid nature: wherefore it is a soft and loose tumor, making the whole eie-lid, which it possesseth, œdematous; so that as if depressed with a weight, it cannot bee lifted up. It hath its name, for that it hath as it were a bladder distended with a whayish humor, which kinde of fault is observed by *Galen* in the liver. Those, who are thus affected, have their eies look red, and flow with tears, neither can they behold the sun, or endure the light. The cure is performed by cutting off the superfluous substance, not hurting the neighbouring parts; and then presently put som salt into the place whence it was taken out (unless the vehemencie of pain hinder) that so the place may bee dried and strengthened, and the rest of the matter (if anie such bee) may bee consumed, and hindred from growing again. Lastly, you shall cover the whole eie with the white of an egg dissolved in rose-water, or som other repercussive.

What *Hydatis* is.

Com. ad aphor. 55. sect. 7.

The cure.

CHAP. IX.

Of the eie-lids fastened or glewed together.

Paulus cap. 15. lib. 6.

SOmtimes it cometh to pass that the upper eie-lid is glewed or fastened to the under, so that the eie cannot bee opened, or so that the one of them may stick or bee fastened to the white coat of the eie, or to the hornie. This fault is somtimes drawn from the first originall, that is, by the default of the forming facultie in the womb (for thus manie infants are born with their fingers fastened together, with their fundaments, privities and ears unperforated) the eie in all other respects beeing well composed. The cause of this affect somtimes proceed's from a wound, otherwhiles from a burn, scald or impostumation, as the breaking of the small pox. It is cured by putting in a fit instrument, and so opening them; but with such moderation, that you touch not the hornie coat, for otherwise it would fall out. Therefore you must put the end or point of your *probe* under the eie-lids, and so lifting them up (that you hurt not the substance of the eie) divide them with a crooked incision-knife.

The cause.

The cure.

The incision made, let the white of an egg beaten with som rose-water bee put into the eie, let the eie-lids bee kept open; yea let the patient himself bee careful that hee often turn it upwards, and lift it up with his fingers, not onely that the medicine may bee applied to the ulcer, but also that they may not grow together again. In the night time let a little pledget dipped in water, and that either simple, or wherein som vitriol hath been dissolved, bee laid thereon. For thus you shall hinder the eie-lids from joyning together again. Then on the third daie the parts or edges of the eie-lids shall bee touched with waters drying without biting or acrimonie, that so they may be cicatrized. But if the eie-lid adhere to the hornie coat at the *pupilla* or apple of the eie, the patient will either bee quite blinde, or verie ill of sight. For the scar which ensue's will hinder the shapes of things from entring to the chrystaline humor, and the visive spirits from passing forth to the objects. For prognosticks, you may learn out of *Celsus*, that this cure is subject to a relapse, so that it may bee shunned neither by diligence nor industrie, but that the eie-lid will alwaies adhere and cleav to the eie.

A diseas subject to relapse.

CHAP. X.

Of the itching of the eie-lids.

MAnie have their eie-lids itch vehemently by reason of salt phlegm, which oftentimes excoriating and exulcerating the parts themselvs, yeeld's a *sanies*, which joyn's together the eie-lids in the night time as if they were glewed together, and make's them watrie and bleared. This affect doth so torment the patients, that it oft-times make's them require the Physicians help. Wherefore general medicines beeing premised, the ulcers shall bee washed with the following *Collyrium*. ℞. *aquæ mellis in balneo mariæ distillatæ* ℥iii. *saccarii candi* ʒi. *aloës lotæ & in pollinem redactæ* ʒß *fiat collyrium.* Which if it do no good, you may use this which follow's. ℞. *Ung. Ægyptiac.* ʒi. *dissolve in aquæ plantaginis quantitate sufficienti.* Let the ulcerated eie-lids bee touched with a soft linnen rag dipped therein, but with care that none thereof fall upon the eie. But when the patient goe's to bed, let him cause them to bee anointed with the following ointment, verie effectual in this case. ℞. *axungiæ porci & butyri recentis, an.* ʒß. *tuth. præpar.* ʒß. *antimon. in aqua euphrasiæ præparati,* ℈ii. *camphoræ gra.* iiii. *misce, & in mortario plumbeo ducantur per tres horas, conflatum indè unguentum, servetur in pyxide plumbeâ.* Som commend and use certain waters fit to cleans, drie, binde, strengthen, and absolutely free the eie-lids from itching and redness; of which this is one.

A detergent *Collyrium.*

℞. *aquæ euphrag. fœniculi, chelidon. an.* ʒß. *sarcocal. nutritæ* ℈ii. *vitriol. rom.* ʒi. *misceantur simul, & bulliant unicâ ebullitione; postea coletur liquor, & servetur ad usum dictum.* Or elſ, ℞. *aquæ rosæ & vini alb. boni an.* ℥iiii. *tuth. præpar. aloës an.* ʒi. *flor. æni* ℈ii. *campbor. gra.* ii. Let them bee boiled according to art, and kept in a glass to wash the eie-lids. Or elſ, ℞. *vini albi* ℔ß. *salis com.* ʒi. let them bee put into a clean Barbar's bason and covered, and kept there five or six daies, and bee stirred once a daie, and let the eie-lids bee touched with this liquor. Som wish that the patients urine bee kept all night in a Barbar's bason, and so the patients eie-lids bee washed therewith. Verely in this affect wee must not fear the use of acrid medicines, for I once saw a woman of fiftie years of age, who washed her eie-lids when they itched with the sharpest vinegar shee could get, and affirmed that shee found better success of this then of anie other medicine. *Vigo* prescribe's a water, whose efficacie above other medicines in this affect, hee saith, hath been proved; and that it is to bee esteemed more worth then gold, the description thereof is thus: ℞. *aq. ros. vini albi odoriferi mediocris vinositatis an.* ℥iiii. *myrobalan. citrini trit.* ʒiß. *thuris* ʒii. *bulliant omnia simul usque ad consumptionem tertiæ partis; deinde immediatè addantur flores æris* ℈ii. *camph. gr.* ii. Let the liquor be kept in a glass well stopped for the fore-said use.

You need not fear to use acrid medicines in the itching of the eie-lids. *Lib. 2. cap. 9. tract. 3.*

CHAP.

CHAP. XI.

Of Lippitudo, *or Blear-eies.*

THere are manie whose eies are never drie, but alwaies flow with a thin, acrid, and hot humor, which causeth roughnes, and upon smal occasions, inflammations, blear or blood-shot eies, and at length also *Strabismus* or squinting. *Lippitudo* is nothing elſ but a certain white filth flowing from the eies, which oft-times agglutinate's or join's together the eie-lids. This diseas often trouble's all the life-time, and is to bee cured by no remedie; in som it is cureable. Such as have this diseas from their infancie, are not to bee cured, for it remain's with them till their dying day. For large heads, and such as are repleat with acrid or much excrementitious phlegm, scarce yeeld to medicines. There is much difference whether the phlegm flow down by the internal vessels under the soul, or by the external which are betweeen the skull and the skin, or by both. For if the internal veins cast forth this matter, it will bee difficultly cured; if it bee cured at all. But if the external vessels cast forth, that cure is not unprofitable, which haveing used medicines respecting the whole bodie, applie's astringent medicines to the shaved crown, as *Empl. contra rupturam*, which may streighten the veins, and as it were suspend the phlegm, useth cupping, and command's frictions to bee made towards the hinde part of the head, and lastly, maketh a Seton in the neck. There are som who cauterize the top of the crown with an hot iron, even to the bone, so that it may cast a scale, thus to divert and stai the defluxion. For local medicines, a *Collyrium* made with a good quantitie of rose-water, with a little vitriol dissolved therein, may serv for all.

What *Lippitudo* is.

A *Collyrium* of vitriol to stay the defluxions of the eies.

CHAP. XII.

Of the Opthalmia, *or inflammation of the Eies.*

AN *Ophthalmia* is an inflammation of the coat *Adnata* and consequently of the whole eie, beeing troublesom by the heat, redness, beating, renitencie, and lastly pain. It hath its original either by som primitive cauſ or occasion, as a fall, stroke, dust, or small sand flying into the eies. For the eie is a smooth part, so that it is easily offended by rough things, as saith *Hippocrates*, *lib. de carnibus*. Or by an antecedent cauſ, as a defluxion falling upon the eies. The signs follow the nature of the material cauſ, for from blood especially cholerick and thin, it is full of heat, redness and pain; from the same allaied with phlegm all of them are more remiss. But if a heavines possess the whole head, the original of the diseas proceed's therefrom. But if a hot pain trouble the forehead, the diseas may bee thought to proceed from som hot distemper of the *Dura mater*, or the *pericranium*; but if in the verie time of the rageing of the diseas the patient vomit, the matter of the diseas proceed's from the stomack. But from whence soever it cometh there is scarce that pain of any part of the bodie, which may bee compared to the pain of the inflamed eies. Verily the greatness of the inflammation hath forced the eies out of their orb, and broken them asunder in divers. Therefore there is no part of Physick more blazed abroad then for sore eies. For the cure, the Surgeon shall consider and intend three things; diet, the evacuation of the antecedent and conjunct cauſ, and the overcoming it by topick remedies. The diet shall bee moderate, eschewing all things that may fill the head with vapors; and those things used that by astriction may strengthen the orifice of the ventricle, and prohibit the vapors from flying up to the head; the patient shall bee forbidden the use of wines, unless peradventure the diseas may proceed from a gross and viscid humor, as *Galen* deliver's it. The evacuation of the matter flowing into the eie, shall bee performed by purgeing medicines, phlebotomie in the arm, cupping the shoulders and neck with scarification, and without: and lastly, by frictions, as the Physician that hath undertaken the cure shall think fit. *Galen* after universal remedies for old inflammations of the eies, commend's the opening of the veins and arteries in the forehead and temples, becauſ for the most part the vessels thereabouts distended with acrid, hot and vaporous blood, cauſ great and vehement pains in the eie.

What *Opthalmia* is, and the causes thereof.

Signs.

The cure.

Com. ad aphor. 31 sect. 6.

Lib. 13. meth. cap. ult.

For the impugning of the conjunct cauſ, divers topick medicines shall bee applied, according to the four sundrie times or seasons that everie phlegmon usually hath. For in the begining when as the acrid matter flow's down with much violence, repercussives do much conduce: and tempred with resolving medicines, are good also in the encreas. R. *aq. ros. & plantag. an.* ℥ß. *mucagin. gum. Tragacanth.* ʒii. *album. ovi quod sufficit, fiat collyrium*, let it bee dropped warm into the eie, and let a double cloth dipped in the same *collyrium* bee put upon it. Or, R. *mucag. sem. pſil. & cydon. extractæ in aq. plant. an.* ℥ß. *aq. solan. & lactis muliebris, an.* ℥i. *trochisc. alb. rha.* ℈. *fiat collyrium*, use this like the former. The veins of the temples may bee streightned by the following medicine. R.. *bol. arm. sang. drac. et mast. an.* ℥.ß. *alb. ovi, aquæ ros. et acet. an.* ℥i. *tereb. lot. et ol. cidon. an.* ℥i.ß. *fiat defensivum*. You may also use

A repercussive medicine.

Astringent emplasters.

Ung.

Ung. de Bolo, empl. diacal. or *contra rupturam* diſſolved in oyl of myrtles, and a little vineger. But if the bitterneſs of pain bee intolerable, the following cataplaſm ſhall bee applied.

An anodine cataplaſm.

℞ *medul. pomor. ſub. ciner. cocti orum* ℥iii. *lactis muliebris* ℥ ß. let it bee applied to the eie, the formerly preſcribed *collyrium* beeing firſt dropped in. Or, ℞ *mucag. ſem. pſil. & cidon. an.* ℥ß. *micæ panis albi in lacte infuſi.* ℥ii *aquæ roſ.* ℥ß. *fiat cataplaſma.* The blood of a Turtle-Dove, pigeon or Hen drawn by opening a vein under the wings, dropped into the eie, aſſwageth pain. Baths are not onely anodine, but alſo alſo ſtay the defluxion by diverting the matter thereof by ſweats; therefore *Galen* much commend's them in ſuch defluxions of the eies as com by fits. In the ſtate when as the pain is either quite taken away or aſſwaged, you may uſe the following medicines. ℞. *ſarcocol. in lacte muliebri nutritæ* ℥i *aloës lotæ in aq. roſar.* ℈ii. *trochiſ. alb. rha.* ℥ß. *ſaccbar. cand.* ℥ii. *aquæ roſ.* ℥iii. *fiat collyrium.* Or, ℞. *ſem. fœniculi, & fœnug. an.* ℥ii. *ſio. chamæ. & melil. an.* m. ß. *coquantur in aq. com. ad* ℥iii. *colaturæ adde tutbiæ præp. & ſacroc. nutritæ in lacte muliebri. an* ℥i. ß. *ſaccbari cand.* ℥ß. *fiat collyrium ut artis eſt.* In the declination the eie ſhall bee fomented with a carminative decoction, and then this *collyrium* dropped thereinto. ℞. *ſacroc. nutritæ* ℥ii. *aloës & myrrh. an.* ℥i. *aq. roſ. & euphrag. an.* ℥ii. *fiat collyrium, ut artis eſt.*

The efficacie of Bathes in pains of the eies.

Ad ophthalm. 7.

Detergent *Collyria.*

CHAP. XIII.

Of the Proptôſis, *that is the falling or ſtarting forth of the eie, and of the* Phthiſis *and* Chemôſis *of the ſame.*

The cauſ.

THe Geerks call that affect *Proptôſis*, the Latines *Procidentia* or *Exitus oculi*, when as the eie ſtand's, and is caſt out of the orb, by the occaſion of a matter filling and lifting up the eie into a great bigneſs, and largeneſs of ſubſtance. The cauſ of this diſeaſ is ſomtimes external, as by too violent ſtraining to vomit, by hard labor in child-birth, by exceſſive and wondrous violent ſhouting, or crying out. It ſomtimes happeneth that a great and cruel pain of the head, or the too ſtrait bindeing of the forehead and temples for the eaſing thereof, or the palſie of the muſcles of the eie, give beginning to this diſeaſ. Certainly ſomtimes the eie is ſo much diſtended by the defluxion of humors, that it break's in ſunder, and the humors thereof are ſhed, and blindeneſs enſue's thereof, as I remember befel the ſiſter of *Lewis de Billy* merchant, dwelling at Paris neer S. *Michael's* bridg.

The cure.

The cure ſhall bee diverſified according to the cauſes. Therefore univerſal medicines beeing premiſed, cupping-glaſſes ſhall be applied to the original of the ſpinal marrow, and the ſhoulders; as alſo Cauteries, or Setons: the eie ſhall bee preſſed or held down with cloths doubled and ſteeped in an aſtringent decoction made of the juice of *Acacia*, red roſes, the leaves of poppie, henbane, roſes and pomgranat pills: of which things poultiſſes may bee made by addition of barlie-meal and the like.

The *Atrophia* of the eie.

There is ſomtimes to bee ſeen in the eie an affect contrarie to this, and it is termed *Atrophia*. By this the whole ſubſtance of the eie grow's lank and decay's, and the apple it ſelf becom's much leſs. But if the conſumption and emaciation take hold of the pupil onely, the Greeks, by a peculiar name and different from the general, term it a *Phthiſis*, as *Paulus* teacheth. Contrarie cauſes ſhall bee oppoſed to each affect; hot and attractive fomentations ſhall bee applied; frictions ſhall bee uſed in the neighboring parts, and laſtly all things ſhall bee applied which may without danger be uſed to attract the blood and ſpirits into the parts.

The *Phthiſis* thereof. *Lib. 3. op. 22.*

There is another affect of the eie, of affinitie to the *Proptôſis*, which by the Greeks is termed *Chemôſis*. Now this is nothing elſ then when when both the eie-lids are turned up by a great inflammation, ſo that they can ſcarce cover the eies, and the white of the eie is lifted much higher up then the black. Somtimes the *Adnata* changeing his wont, looketh red; beſides alſo, this affect may take its original from external cauſes, as a wound, contuſion and the like. But according to the varietie of the cauſes, and the condition of the preſent affect fixed and remaining in the part, diverſ remedies ſhall bee appointed.

The *Chemôſis.* *Paulus l. 3. c. 2.*

CHAP. XIV.

Of the Vngula, or Web.

THe *Vngula, Pterygion* or Web is the growth of a certain fibrous and membranous fleſh upon the upper coat of the eie called *Adnata*, ariſeing more frequently in the bigger, but ſomtimes in the leſſer corner towards the temples. When it is neglected, it cover's not onely the *Adnata*, but alſo ſom portion of the *Cornea*, and coming to the pupil it ſelf hurt's the ſight thereof. Such a Web ſomtimes adhere's not at all to the *Adnata*, but is onely ſtretched over it from the corners of the eie, ſo that you may thruſt a *probe* between it and the *Adnata*: it is of ſeveral colors, ſomwhiles red, ſomwhiles yellow, ſomwhiles duskiſh, and otherwhiles white. It hath its original either from

from external causes, as a blow, fall, and the like; or from internal, as the defluxion of humors into the eies. The *Ungula* which is inveterate, and that hath acquired much thicknes and bredth, and besides doth difficultly adhere to the *Adnata*, is difficultly taken away, neither may it bee helped by medicines whereby scars in the eies are extenuated. But that which covereth the whole pupil must not bee touched by the Surgeon, for beeing cut away, the scar which is left by its densitie hindereth the entrance of objects to the crystalline humor, and the egress of the animal spirit to them. But oftentimes it is accompanied with an inflammation of the eies, a burning, itching, weeping defluxion, and swelling of the eielids. That the cure may rightly and happily proceed, hee must first use a spare diet, purgeing medicines shall bee given, and blood taken away by opening a vein, especially, if there bee great inflammation. For particular remedies, this excrescence shall bee eaten away, or at least kept from growth, by dropping into the eie *collyrium* of vitriol described in wounds of the eies. But if that wee profit nothing by this means, it remaineth, that wee take it away with the hand after the following manner.

What Web curable, and what incurable.

The cure.

You shall set the patient upon a fourm or stool, and make him lean much back, and bee so held firmly, that hee may not fall nor stir, then must you open his sore eie, putting therein a *speculum oculi* formerly described in treating of the wounds of this part, and then must you lift up the Web it self with a sharp little hook, with the point turned a little in, and put under the mid'st of the Web; when you have lifted it a little up, thrust a needle threded with a smooth thred between it and the *Adnata*, then takeing hold of the hook, and the two ends of the thred drawn through with the needle, and lifting up the Web by them, you shall gently begin to separate it from the substance of the eie lying there-under, beginning at the original thereof with a crooked incision-knife, and so prosecute it even to the end, yet so as you hurt no part of the *Adnata*, nor *Cornea*.

The cutting of the Web.

The figures of little books, a needle, and crooked incision-knife.

Little books. *A needle.* *A crooked incision-knife.*

Then must it bee cut off with a pair of scissers, and the white of an egg beaten with som Rose-water laid thereon, and often renewed. Afterwards the eie must everie day bee opened, least coming to cicatrization, the eie-lids shall bee glewed together in that part whereas the Web is taken away, which also shall bee hindered by putting of common salt, sage and cummin-seeds into the eie, beeing first champed and chawed in the mouth. There are som who in stead of the crooked knife separate the Web from the *Adnata* with a horse's hair, others do it with a goos quil made readie for the same purpose, takeing heed that they hurt not the caruncle at the corner by the nose, for it will follow if that you draw the Web away too violently; and if it bee cut, there will remain a hole, through which dureing the rest of the life a weeping humor will continually flow, a disease by the Greeks termed *Rhyas*. If after the cutting there bee fear of inflammation, linnen rags moistned in repelling medicines, formerly prescribed in wounds of the eie, shall bee laid thereupon.

CHAP. XV.

Of the Egilops, Fistula lacrymosa, *or weeping Fistula of the Eie.*

The use of the glandule at the greater corner of the eie.

AT the greater corner of the eie there is a glandule, made for the receiving and containing the moisture which serveth for the lubricating and humecting the eye, least it should

The differences.

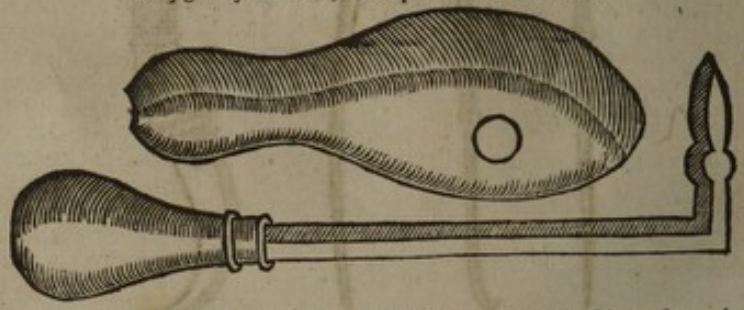
ſhould drie by continual motion. This glandule ſomtimes by a ſanguin or pituitous defluxion falling violenrly from the brain, ſwel's, impoſtumate's and ulcerate's with an ulcer, not ſeldom degenerateing into a fiſtula, ſo that in ſucceſs of time it rotteth the bone that lieth under it: of ſuch fiſtulae's, ſom are open outwardly, and theſe uſually have their original from a phlegmon; other ſom are inwardly, and thoſe are ſuch as at firſt ſwelled by the defluxion or congeſtion of a phlegmatick matter, ſo that there appeareth no hole outwardly, but onely a tumor of the bigneſs of a peaſ, this tumor beeing preſſed, floweth with a ſanious, ſerous and red or otherwiſe with a white and viſcid matter, and that either by the corner of the eie, or by the inſide of the noſe. Som have this matter flowing continually, others have it onely monethly, which is proper alſo to ſom fiſtulae's. Such weeping fiſtulae's if they becom old, cauſan *Atrophia* of the eie, and ſomtimes blindeneſs and a ſtinking breath. Therefore wee muſt diligently and ſpeedily by phyſical and chirurgical means reſiſt the breeding diſeaſ. Wherefore, haveing uſed general medicines, wee muſt com to particulars. Therefore if the ulcer bee not ſufficiently wide, it ſhall bee enlarged by putting tents of ſpunge therein. The fleſh of the Glandule encreaſing more then is fit, ſhall bee corrected by putting therein the catheretick pouders of Mercurie, calcined vitriol, or ſom *aqua fortis*, or oil of vitriol, and laſtly, by a potential cauterie. If you cannot prevail by theſe means, and that the bone begin's to rot, and the patient bee ſtout hearted, then uſe an actual cauterie whoſe uſe is far more effectual, readie, certain and execellent, then a potential cauterie, as I have tried in manie with happie ſucceſs. In my opinion it make's no matter, whether the cauterie bee of gold, ſilver or iron; for the efficacie it hath, proceedeth not from the matter, but from the fire. Yet if wee muſt religiouſly obſerv and make choice of metals, I had rather have it of Iron, as that which hath a far more drying and aſtringent facultie then gold, for that the element of earth beareth the chief ſway therein, as appeareth by the waters which flow through iron-mines. Wherefore you ſhall cauſ to bee made a triangular Iron, ſharp at the end, that it may the more ſpeedily penetrate. And then the ſound eie and adjacent parts being well covered and defended, and the patien'ts head firmly holden in one's hand, leaſt the patient beeing frighted, ſtir himſelf in the verie inſtant of the operation. But a plate of iron ſomwhat depreſſed in the mid'ſt, for the cavitie of the greater corner, ſhall bee applied and fitted to the pained eie. This plate ſhall bee perforated that the hot Iron may paſs thereby to the fiſtula lying there-under, and ſo may onely touch that which is to bee cauterized.

Periodical and Typical Fiſtulaes.

The cure.

The efficacie of an actual cauterie.

The figure of a cauterie, and a plate with a hole therein.



Things to bee don after the cauterizing.

After the bone is burnt with the cauterie, a *collyrium* made of the whites of eggs beaten in plantain and night-ſhade waters muſt bee poured into the hole it ſelf, the eie and all the neighboring parts; but the patient ſhall bee laid in bed, with his head ſomwhat high, and the *collyrium* ſhall bee renued as often and as ſoon as you ſhall perceiv it to grow drie. Then the fall of the Eſchar ſhall bee procured by anointing it with freſh butter; when it is fallen away, the ulcer ſhall bee cleanſed, filled with fleſh, and laſtly cicatrized.

CHAP. XVI.

Of the Staphyloma, *or grape-like ſwelling.*

What a *Staphyloma* is, and the cauſes thereof.

Staphyloma is the ſwelling of the hornie and grape-like coat, bred through the occaſion of an humor flowing down upon the eie, or by an ulcer, the hornie coat beeing relaxed, or thru'ſt forth by the violence of the puſtule generated beneath. It in ſhape reſembleth a grape, whence the Greeks ſtyle it *Staphyloma*. This tumor is ſomtimes blackiſh, otherwhiles whitiſh. For if the hornie coat bee ulcerated and fretted in ſunder, ſo that the grapie coat ſhew it ſelf, and fall through the ulcer, then the *Staphyloma* will look black like a ripe grape, for the utter part of the *Uvea* is blackiſh. But if the *Cornea* bee onely relaxed and not broken, then the ſwelling appear's of a whitiſh color like an unripe grape. The Antients have made manie kindes or differences thereof. For if it bee but a ſmall hole of the broken *Cornea* by which the *Uvea* ſheweth or thruſteth forth its ſelf, they then termed it *Myocephalon*, that is, like

Paulus and *Actius.*

the

the head of a flie. But if the hole were large, and also callous, they called it *Clavus*, or a nail; if it were yet larger, then they termed it *Acinus*, or a grape. But in what shape or figure soever this diseas shall happen, it bringeth two discommodities, the one of blindeness, the other of deformitie. Wherefore here is no place for Surgerie to restore the sight, which is already lost, but onely to amend the deformitie of the eie; which is by cutting off that which is prominent. But you must take heed that you cut away no more then is fit, for so there would bee danger of pouring out the humors of the eie. Everie *Staphiloma* infers incureable blindness.

CHAP. XVII.

Of the Hypopyon, *that is the suppurate or putrefied eie.*

PUS, or Quitture is somtimes gathered between the hornie and grapie coat from an internal or external caus: From an internal, as by a great defluxion, and oftentimes after an inflammation; but externally, by a stroke, through which occasion, a vein beeing opened hath poured forth blood thither, which may presently bee turned into Quitture. For the cure, universal remedies beeing premised, cupping-glasses shall bee applied, with scarifications and frictions used. Anodine and digestive *collyria* shall bee poured from above downwards. *Galen* writes that hee hath somtimes evacuated this matter, the *Cornea* beeing opened at the *Iris*, in which place all the coats meet, concur and are terminated. I have don the like, and that with good success, *Jaines Guillemeau* the Kings Surgeon beeing present, the Quitture beeing expressed and evacuated after the apertion. The Ulcer shall bee claensed with *Hydromel*, or som other other such like medicine. The caus. *Lib.14. method. cap.ult.*

CHAP. XVIII.

Oo the Mydriasis, *or dilatation of the Pupil of the Eie.*

MYdriasis is the ditatation of the pupil of the eie, and this happeneth either by nature or chance: the former proceedeth from the default of the first conformation, neither is it cureable; but the other is of sorts; for it is either from an internal caus, the off-spring of an humor flowing down from the brain, wherefore Physical means must bee used for the cure thereof. Now that which cometh by anie external occasion, as a blow, fall, or contusion upon the eie, must bee cured by presently applying repercussive and anodine medicines, the defluxion must bee hindered by diet skilfully appointed, phlebolomie, cupping, scarification, frictions and other remedies which may seem convenient. Then must you com to resolving medicines, as the blood of a Turtle-dove, Pigeon, or chicken reeking-hot out of the vein, beeing poured upon the eie and the neighboring parts. Then this following cataplasm shall bee applied thereto ℞. *farinæ fabar. & hordei an.*℥iii. *ol. rosar. & myrtillor. an*℥i. ß.*pul. ireos flor.*℥ii. *cum sapa fiat cataplasma.* You may also use the following fomentation. ℞. *rosar.rub. & myrtyl.an.*m.i. *florum melil. & chamæm.an.*p.i. *nucum cupr ess.*℥i. *vini austeri* lb.ß. *aq.rosar. & plantag. an.*℥iii. make a decoction of them all for a fomementation to bee used with a sponge. The Cure. A digesting Cataplasm.

CHAP. XIX.

Of a Cataract.

A Cataract is called also by the Greeks *Hypochima*, by the Latines *suffusio*. Howsoever you term it, it is nothing elf but the concretion of an humor into a certain thin skin under the hornie coat, just against the apple or pupil, and as it were swimming upon the waterie humor; and whereas the place ought to bee emptie, opposing it self to the internal facultie of seeing, whereby it differeth from spots and scars growing upon the hornie coat and *Adnata*. It somtimes covereth the whole pupil, otherwhiles but the one half thereof, and somwhiles but a smal portion thereof. According to this varietie the sight is either quite lost, weak, or somwhat depraved, becaus the animal visive spirit cannot in its entire substance pass through the densitie thereof. The defluxion of the humor whence it proceed's, is either caused by an external occasion, as a stroke, fall, or by the heat or coldness of the encompassing air, troublesom both to the head and eies; or elf it is by an internal means, as the multitude, or elf the acrid hot and thin qualitie of the humors. This diseas also somtimes taketh its original from gross and fumid humors sent from a crude stomack, or from vaporous meats or drinks, up to the brain, and so it falleth into the eies, where, by the coldness, straitness and tarrying in the place, they turn into moisture, and at length into that concretion or film which wee see: The signs may bee easily drawn, from that wee have alreadie delivered. For when the cataract is formed and ripe, it resembleth a certain thin membrane spred over the pupil, and A Cataract. The differences. Causes. Signes.

and appeareth of a different color, according to the varietie of the humor whereof it conſiſteth, one while white, another while black, blue, aſh-colored, livid, citrine, green. It ſomtimes reſembleth quick-ſilver, which is verie trembling and fugitive, more then the reſt. At the firſt when it beginneth to breed, they ſeem to ſee manie things, as flies flying up and down, hares, nets, and the like, as if they were careleſly toſſed up and down before their eies: ſomtimes everie thing appeareth two, and ſomwhiles leſs then they are; becauſ the viſive ſpirit is hindered from paſſing to the objects by the denſitie of the skin, like as a cloud ſhadowing the light of the Sun. Whence it is that the patients are duller ſighted about noon, and ſurer and quicker ſighted in the morning and evening, for that the little viſive ſpirit diffuſed through the air, is diſperſed by the greater light, but contracted by the leſs. Now if this film cover half the pupil, then all things ſhew but by halfs; but if the mid'ſt thereof bee covered, and as it were the centre of the chryſtaline humor, then they ſeem as if they had holes or windows: but if it cover it all, then can hee ſee nothing at all, but onely the ſhadows of viſible bodies, and of the Sun, Moon, Stars, lighted candles, and the like luminous things, and that but confuſedly, and as by conjecture.

CHAP. XX.

Of the phyſical cure of a beginning Cataract.

Diet for ſuch as are troubled with a Cataract.

A Begining Cataract is hindered from growing and concretion by diet conveniently and artificially preſcribed, by the abſtinence from wine, eſpecially more ſtrong and vaporous, and forbearing the uſe of meats, which yeeld a phlegmatick juice and vaporous: as peaſ, beans, turneps, cheſnuts, and, laſtly, all ſuch things as have the facultie of ſtirring up the humors, and cauſing defluxion in the bodie, ſuch as are all ſalt and ſpiced meats, as alſo garlike, onions, muſtard. The immoderate uſe of Venerie hurts more then all the reſt, for that it more violently exagitate's the whole bodie, weaken's the brain and head, and beget's crude humors. Let his bread bee ſeaſoned with ſom fennel ſeeds, for it is thought to have a facultie of helping the ſight, and clearing the eies, and diſſipating the miſtie vapors in the ſtomack before they can aſſcend to the brain. Wherefore by the ſame reaſon it is good to uſe marmelade of quinces, conſerv of roſes, and common drige powder, or anie ſuch like compoſed of things good to break winde, or corroborate the ventricle. Phlebotomie and purging, if they bee requiſite, ſhall bee fitly appointed: Ventoſes ſhall bee applied to the ſhoulders and neck; and phlegmatick matter ſhall bee diverted and evacuated by the mouth with uſing maſticatories in the morning. There bee ſom which beleev, that a begining Cataract may bee diſſipated and diſcuſſed by often rubbing the eie-lids with his fingers, and in like ſort by the often and earneſt beholding of the Stars, and the Moon when it is at the full, looking-glaſſes, diamonds, and all other ſuch like bright ſhining things. I beleev, that by beams plentifully and ſuddenly brought and diffuſed over the eie, directly oppoſite againſt ſome bright ſhining thing, it may ſeem to have a penetrating, dividing, diſſolving, as alſo a conſuming and drying facultie. Beſides, alſo the hot breath of him who holdeth in his mouth, and chaweth fennel ſeeds, aniſ-ſeeds, coriander ſeeds, nutmeg, cinnamon, cloves, and the like, hath a great facultie, the eies beeing firſt gently rubbed with the finger, it beeing breathed in neer at hand, and often received, to heat, attenuate, reſolv, digeſt and diffuſe the humor which is readie to concrete. Moreover, this *collyrium* of *John Vigo* is thought verie powerful to clear the eies, ſtrengthen the ſight, hinder ſuffuſions, and diſcuſs them, if at anie time they concrete, and begin to gather. ℞. *hepatis hircini ſani & recentis* ℔ii. *calomi aromatici & mellis an.* ℥ß. *ſucci rutæ,* ʒiii. *aquæ chelidoniæ, fœniculi, verbeniæ euphoſiæ, an.* ℥iii. *piperis longi, nucis moſchatæ, caryophyllorum an.* ʒii. *croci* ℈i. *floris roriſmarini aliquantum contriti,* m.ß. *ſarcocollæ, aloes hepaticæ, an.* ʒiii. *fellis ratæ, leporis & perdicis, an.* ʒi. *terantur omnia, tritiſque adde ſacchari albi* ℥ii. *mellis roſati* ʒvi. *conjiciantur in alembicum vitreum, & diſtillentur in balneo Mariæ:* Let this diſtilled liquor bee often dropped into the eies. But if you prevail nothing by all theſe medicines, and that the cloudie and heaped up humor doth daily increaſ and thicken, then muſt you abſtain from remedies, and expect until it bee no more heaped up, but thickned, yea until it ſeem to bee grown ſomwhat hard. For ſo it may bee couched with a needle; otherwiſe, if this ſame skin ſhall not bee ripe, but more tender then is fitting, when you ſhall com to the operation, it will bee broken and thruſt through with the needle, and not couched. On the contrarie, if it bee too hard, it will reſiſt the needle, neither will it ſuffer it ſelf to bee eaſily couched. Wherefore it is requiſite that the Surgeon know when it is ripe, and hee muſt diligently obſerv the ſigns whereby hee may diſcern a ripe Cataract from an unripe; and that which is cureable, from that which is uncureable. For that onely which is ripe and cureable is to bee couched; that which is unripe, that is, ſuch an one as is more tender, and as it were crude, and that which is more hard and denſ, and laſtly, that is uncureable muſt not bee attempted at all.

Bread ſeaſoned with fennel-ſeeds.

How bright ſhining things may diſſipate a begining Cataract.

A *Collyrium* diſſipating a begining Cataract.

A Cataract muſt not bee couched, unleſs it bee ripe.

CHAP.

CHAP. XXI.

By what signs ripe and cureable Cataracts may bee discerned from unripe and uncureable ones.

IF the sound eie beeing shut, the pupil of the sore or suffused eie, after it shall bee rubbed with your thumb, bee presently dilated & diffused, and with the like celeritie return into the place, figure, color and state, it is thought by som to shew a ripe and confirmed Cataract. But an unripe, and not to bee couched, if the pupil remain dilated and diffused for a long while after. But it is a common sign of a ripe, as also more dens, and consequently uncureable suffusion, to bee able to see nor distinguish no visible thing beside light and brightness; for to discern other objects sheweth that it is not yet ripe: Therefore the sound eie beeing shut and pressed, the pupil of the other rubbed with your thumb, is dilated, enlarged, swelleth, and is more diffused; the visive spirits by this compression beeing as it were forced from the sound into the sore eie. But these following Cataracts are judged uncureable, that is, such as are great, such as when the eie-lid is rubbed are nothing dilated or diffused, whose pupil becometh no broader by this rubbing: for hence you may gather, that the stopping or obstruction is in the optick nerv, so that how cunningly and well soever the Cataract bee couched, yet will the patient continue blinde; you shall do no more good in couching a Cataract, which is in an eie consumed and wasted with a *Phthisis*. Also that Cataract is uncureable, which is occasioned by a most grievous disease, to wit, by most bitter and cruel pains of the head, or by a violent blow. Such as are of a plaister-like, green, black, livid, citrine and quick-silver-like color, are usually uncureable. On the contrarie, such as are of a Chesnut color, or of a skie or sea-water color, with som little whiteness, yeeld great hope of a happie and successful cure.

Uncureable Cataracts.

Cureable Cataracts.

CHAP. XXII.

Of the couching a Cataract.

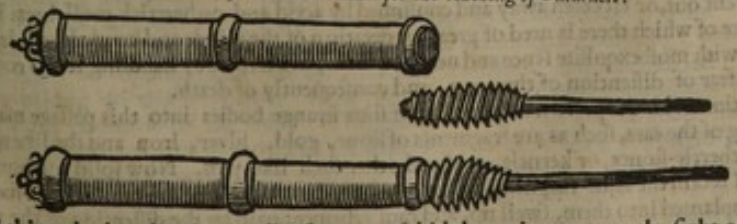
AFter you shall know by the fore-mentioned signs that the Cataract is cureable, it remains that you attempt the couching thereof, but so, that there bee nothing which may hinder. For if the pain of the head, cough, nauseousness or vomiting at that time trouble the patient, you shall then bestow your labor in vain: Wherefore you must expect until these symptoms be gon. Then make choice of a season fitting for that purpose, that is, in the decreas of the moon, when the air is not troubled with thunder nor lightning, and when as the Sun is not in Aries, becaus that sign hath dominion over the head. Then let the Surgeon consult a Physician whether purging or blood-letting bee convenient for the patient, so to resist plethorick symptoms, otherwaies readie to yeeld matter for relaps. Two daies after you must make choice of a place furnished with indifferent or competent light, and the Patient being fasting shall bee placed in a straight chair, so that the light may not fall with the beams directly upon him, but sidewise. The eie which shall bee cured must bee made more steddie, by laying and bindeing woolI upon the other: Then the Surgeon shall seat and place himself directly against the patient upon a seat somwhat higher, and bidding the patient put his hands down to his girdle, hee shall hold the patient's legs between his knees. One shall stand at the patient's back, who shall hold his head, and keep it from stirring; for by a little stirring hee may lose his sight for ever. Then must you prepare and make readie your needle, and thrust it often into som strong thick cloth, that it may bee as it were smooth by this motion, and for the performance of the work in hand with the less pain somwhat warmed. It must bee made of iron or steel, and not of gold or silver, it must bee also flatted on the sides, and sharp-pointed, that so it may the better pierce into the eie, and wholly couch the Cataract once taken hold of; and least it should slip in the Surgeon's hand, and bee less steddie, it shall bee put into a handle, as you may see by the following figure.

When to couch a Cataract.

The place.

The needle.

A needle inserted in a handle for the couching of Cataracts.



All things beeing thus in a readiness, you must bid the patient to turn the sight of his eie towards his nose, & the needle must bee boldly thrust (for it is received in a place that is void, & onely filled with spirits) directly by the coat *Adnata*, in the middle space between the lesser corner

corner and the hornie coat, juſt againſt the mid'ſt of the Cataract, yet ſo, as that you hurt no vein of the *Adnata*, and then by ſtirring it as it were diverſly until it com to the mid'ſt of the pupil and ſuffuſion. When it is com thither, the needle muſt bee inclined from above downwards to the ſuffuſion, and there to bee ſtirred gently until by little and little it couch or bring down the Cataract as whole as may bee beneath the compaſs of the pupil; let him ſtill follow it though couched with his needle, and ſomwhat violently depreſs and keep it down for ſom ſhort ſpace, that ſo it may reſt and ſtay in that lower place whether it is depreſſed. The Surgeon ſhall trie whether it firmly remain there or no, bidding the patient preſently to move his eie; for if it remain conſtantly ſo, and do not return again, the cure is perfect. Then muſt the needle bee lifted up by little and little, neither muſt it preſently bee taken forth, that if the Cataract ſhould bear up, or riſe again, that it might again, and ſo often (whil'ſt the work is yet hot, and all things in a readineſs) bee couched towards the leſſer corner, until it bee fully and ſurely hid. Then muſt you draw back the needle gently, and after the ſame manner as you put it in; leſt if you uſe not moderation, you bring back the Cataract from whence you couched it, or grievouſly offend the cryſtalline humor, the prime inſtrument of ſight, or the pupil with danger of dilateing thereof. Som as ſoon as the work is don, give the patient ſomthing in his hand to look upon: but *Paulus* approov's not thereof, for hee fear's leſt his endeavoring or ſtriveing to ſee, may draw back the Cataract. Wherefore it is more wiſedom and better, preſently after the drawing forth of the needle, to put on a ſoft rag the white of an egg beaten in roſe-water with a little choice alum, and ſo applie it to the eie and neighboring parts for to binde and hinder the inflammation; then alſo you muſt together therewith binde up the ſound eie, leſt by ſtirring to ſee, it might together therewith draw and move the ſore eie, by reaſon of the ſympathie and conſent they mutually have by the optick nervs. After all things are thus performed, the patient ſhall bee laid in a ſoft bed, and ſo placed, that his head may lie ſomwhat high; let him bee laid far from noiſ, let him not ſpeak, nor eat anie hard thing that may trouble his jaws, wherefore let him feed upon liquid meats, as panado, barly cream, cullilſes, gellies, rear-eggs, and other meats of the like nature. At the end of eight daies the ligature that binde's up the eies ſhall bee looſed, and his eies waſhed with roſe-water, and putting on ſpectacles, or ſom taffatie, the patient ſhall by little and little accuſtom himſelf to the light, leſt hee ſhould bee offended by the ſudden meeting wth light. But if the ſuffuſion, after ſom ſhort while after, lift it ſelf up again, it muſt bee couched again, but through a new hole, for the eie is pained and tender in the former place. It ſomtimes happen's by the touch of the needle that the Cataract is not couched whole, but is broken into manie pieces; then therefore each of them muſt bee followed, and couched ſeverally: if there bee anie verie ſmall particle which ſcape's the needle, it muſt bee let alone, for there is no doubt but that in proceſs of time it may bee diſſolved by the force of the native heat. There are alſo ſom Cataracts which at the firſt touch of the needle are diffuſed and turn into a ſubſtance like to milk or troubled water, for that are not throghly ripe, yet theſe put us in good hope of recoverie, and it bee but for this, that they can never afterwards concrete into one bodie as before. Wherefore at the length they are alſo diſcuſſed by the ſtrength of the native heat, and then the eie recover's its former ſplendor. If that anie other ſymptoms com unlooked for, they ſhall bee helped by new counſels and remedies.

Gal. lib. 10. de uſu partium. c. 5 Celſ. lib. 7.

The ſign of a Cataract well couched.

Lib. 6. cap. 11.

What to bee don after the couching of a Cataract.

Of a Cataract which is broken to peeces.

CHAP. XXIII.

Of the ſtopping of the paſſage of the Ears, and the falling of things thereinto.

The cauſ.

SOmtimes happeneth that children are born without anie holes in their ears, a certain fleſhly or membranous ſubſtance growing in their bottom or firſt entrance. The ſame may alſo happen afterwards by accident, they beeing ulcerated by ſom impoſtume or wound, and the ear ſhut up by ſom fleſhly excreſcence or ſcar. When as the ſtopping is in the bottom of the cavitie, the cure is more difficult then if it were in the firſt entrance, But there is a double way of cure; for this ſubſtance, whatſoever it bee, muſt either bee cut out, or elſ eaten away and conſumed by acrid and catheretick medicines; in performance of which there is need of great moderation of the minde and hand. For it is a part endued with moſt exquiſite ſence and near the brain, wherefore by handling it too roughly, there is fear of diſtention of the nerve, and conſequently of death.

The cure.

Somtimes alſo the preternatual falling of ſom ſtrange bodies into this paſſage maketh a ſtopping of the ears, ſuch as are fragments of ſtone, gold, ſilver, iron and the like metals, pearls, cherrie-ſtones, or kernels, peaſ and other ſuch like pulſ. Now ſolid and bonie bodies ſtill retain the ſame magnitude; but peaſ, ſeeds and kernels, by drawing the moiſture there implanted into them, ſwell up, and cauſ vehement pain by the diſtention of the neighboring parts, wherefore the ſooner they are drawn forth, the better it is for the patient. This ſhall bee don with ſmall pincers and inſtruments made in the ſhape of ear-picks. But if you profit nothing thus, then muſt you uſe ſuch gimblets as are made for the drawing forth

of

of bullets shot deep into the bodie. Little stones and bodies of the like stonie hardness shall bee forced forth by the brain, provoked to concussion by sneezing, and by dropping som oil of almonds first into the passage of the ear, that the way may bee the more slipperie; for it will com to pass by this sneesing, or violence of the internal air forcibly seeking passage out, that at length they may bee cast forth, the mouth and nostrils beeing stopped with the hand. But if wee cannot thus prevail, it remain's, that wee cut open the passage with an incision-knife, so much as shall bee sufficient for the putting in and using of an instrument for to extract them. If anie creeping things of little creatures, as fleas, ticks, pismires, gnats and the like, which somtimes happeneth, shall get therein, you may kill them by dropping in a little oil and vinegar. There is a certain little creeping thing, which for piercing and getting into the ears, the French call *Perse-oreille* (wee an ear-wig.) This, if it chance to get into the ear, may bee killed by the foresaid means, you may also catch it, or draw it forth by laying half an apple to your ear, as a bait for it.

The concussive force of sneesing.

CHAP. XXIV.

Of getting of little bones and such like things out of the jaws and throat.

Somtimes little bones and such like things in eating greedily use to stick, or as it were fasten themselvs in the jaws or throat. Such bodies if you can com to the sight of them, shall bee taken out with long, slender and crooked mallets made like a Crane's-beak. If they do not appear, nor there bee no means to take them forth, they shall bee cast forth by causing vomit, or with swallowing a crust of bread, or a drie fig gently chawed, and so swallowed; or elf they shall bee thrust down into the stomack, or plucked back with a leek, or som other such long and stiff crooked bodie anointed with oil, and thrust down the throat. If anie such like thing shall get into the weazon, you must caus coughing, by taking sharp things, or elf sneesing, so to cast forth whatsoever is there troublesom.

The cure different according to the places where they stick.

CHAP. XXV.

Of the Tooth-ache.

Of all pains, there is none which more cruelly tormenteth the patients then the Tooth-ache. For wee see them oft-times after the manner of other bones to suffer inflammation, which will quickly suppurate, and they becom rotten, and at length fall away piece-meal; for wee see them by daily experience to bee eaten and hollowed, and to breed worms, som portion of them putrefying. The caus of such pain is either internal, or external and primitive. The internal is a hot or cold defluxion of humors upon them, filling their sockets, and thence consequently driving out the teeth; which is the reason that they stand somtimes so far forth, that the patient neither dare's, nor can make use of them to chaw for fear of pain: for that they are loos in their sockets by the relaxation of the gums, caused by the falling down of the defluxion. When as they are rotten and perforated even to the roots, if anie portion of the liquor in drinking, fall into them, they are pained as if you thrust in a pin or bodkin, the bitterness of the pain is such. The signs of a hot defluxion are sharp and pricking pain, as if needles were thrust into them, a great pulsation in the root of the pained tooth and the temples, and som eas by the use of cold things. Now the signs of a cold defluxion are a great heavines of the head, much and frequent spitting, som mitigation by the use of hot remedies. In the bitterness of pain wee must not presently run to Tooth-drawers, or caus them presently to go in hand to pluck them out. First consult a Physician, who may prescribe remedies according to the varietie of the causes Now heer are three intentions of cureing. The first is concerning diet; the other for the evacuation of the defluxion or antecedent caus; the third for the application of proper remedies for the asswageing of pain. The two-former scopes, to wit, of diet, and diverting the defluxion by purgeing, phlebotomie, application of cupping-glasses to the neck and shoulders, and scarification, do absolutely belong to the Physician. Now, for proper and topick medicines they shall bee chosen contrarie to the caus. Wherefore in a hot caus, it is good washing the mouth with the juice of pomgranats, plantain-water, a little vinegar wherein roses, *balaustiæ* and *sumach* have been boiled. But such things as shall bee applied for the mitigating of the pain of the teeth, ought to bee things of verie subtle parts, for that the teeth are parts of dens consistence. Therefore the ancients have alwaies mixed vinegar in such kind of remedies. R. *rosar. rub. sumach. hordei, an.* m. ß. *seminis hyoscyami conquassati* ʒii. *sandalorum an.* ʒi. *lactucæ summitatum rubi, solani, plantaginis, an.* m. ß. *bulliant omnia in aquæ* ℔. iiii. *& panco*

The Tooth-ach a most cruel pain.

The caus thereof.

The signs of this or that defluxion.

Three scopes of cureing.

A cold and repercussive lotion for the mouth.

& pauco aceto ad hordei crepaturam. Waſh the mouth with ſuch a decoction beeing warm. You may alſo make Trochiſces for the ſame purpoſe after this manner. R. *ſem. hyoſciami,*

Trochiſces for a hot defluxion.

ſandaracha, coriandri, opii an. ʒß. terantur & cum aceto incorporentur, formentúrque trochiſci apponendi dentibus dolentibus. Or elſ, R. *ſeminis portulacæ, hyoſcyami, coriandri, lentium, corticis ſantali citrini, roſar. rub. pyrethri, camphoræ, an.* ʒß. let them all bee beaten together with ſtrong vineger, and made into trochiſces, with which beeing diſſolved in roſe-water, let the gums and whole mouth bee waſhed when need requireth. But if the pain bee not aſſwaged with

Narcoticks.

theſe, you ſhall com to narcoticks, which may ſtupefie the nerv; as, R. *ſeminis hyoſcyami albi, opii, camphoræ, papaveris albi, an. quantum ſufficit, coquantur cum ſapâ, & denti applicentur.* Beſides, you muſt alſo put this following medicine into the ear of the pained ſide. R. *opii & caſtorei, an.* ℈i. *miſceantur cum oleo roſato:* It hath ſomtimes availed in ſwoln and diſtended gums, beeing firſt lightly ſcariñed, to have applied leeches, for the evacuation of the conjunct matter, as alſo to have opened the veins under the tongue, or theſe which are behinde the ears. For I remember that I, by theſe three kindes of remedies, aſſwaged great pains of the teeth. Yet there bee ſom who in this affect open not theſe veins which are behinde the ears, but thoſe which are conſpicuous in the hole of the ear in the upper part thereof.

Pain of the teeth ariſeing from a cold cauſ and defluxion, may bee helped by theſe remedies; boil roſemarie, ſage, and pellitorie of Spain in wine and vineger, and add thereto a little *aqua vitæ*, in this liquor diſſolv a little treacle, and waſh your teeth therewith. Others mingle gum *ammoniacum* diſſolved in *aqua vitæ* with a little *ſandaracha* and myrrh, and lay it to the pained tooth, after *Vigoe's* counſel. *Meſue* think's that beaten garlick carried in the right or leſt hand, aſſwage's the pain, as the teeth ake upon the right or left ſide. But I beeing once troubled with grievous pain in this Kinde, followed the counſel of a certain old woman, and laid garlick roſted under the embers to my pained tooth, and the pain forthwith ceaſed. The ſame remedie uſed to others troubled with the like affect, had like ſucceſs. Moreover, ſom think it available if it bee put into the auditorie paſſage. Others drop into the ears oil of *caſtoreum*, or of cloves, or ſom ſuch other chymical oil. It is good alſo to waſh the teeth with the following decoction. R. *rad. pyrethri* ʒß. *menthæ & rutæ an.* p. i. *bulliant in aceto*, and

Hot fumes.

with this decoction beeing warm, waſh the teeth. Som like fumes better, and they make them of the ſeeds of *Colloquintida* and muſtard, and other like; they take the ſmoak by holding their mouths over a funnel. Other ſom boil pellitorie of Spain, ginger cinnamon, alum, common ſalt, nutmegs, cypreſs-nuts, aniſ and muſtard ſeeds, and *euphorbium* in oxycrate, and in the end of the decoction add a little *aqua vitæ*, and receiv the vapor thereof through a funnel; as alſo they waſh their teeth with the decoction, and put cotton dipped therein into the ear, firſt dropping in a little thereof. Som there are which affirm, that to waſh the teeth with a decoction of Spurge is a verie good and anodine medicine in the tooth-

Veſicatories.

ach. I have oft-times aſſawaged intolerable pains of the teeth, by applying veſicatories under the ear, to wit, in that cavitie whereas the lower jaw is articulated with the upper: for the vein, arterie and ſinew which are diſtributed to the roots of the teeth, lie thereunder. Wherefore the bliſters beeing opened, a thin liquor run's out, which doth not onely cauſ, but alſo nouriſh or feed the diſeaſ. But if the tooth bee hollowed, and that the patient will not have

Cauſticks.

it pull'd out, there is no ſpeedier remedie, then to put in cauſtick medicines, as oil of vitriol, *aqua fortis*, and alſo a hot iron; for thus the nerv is burn't in ſunder, and loſeth it's ſenſ. Yet ſom affirm that the milkie juice that flow's from Spurge made into a paſte with *olibanum* and *amylum*, and put into the hollowed tooth, will make it preſently to fall away in pieces. When the gums and cheeks are ſwoln with a manifeſt tumor, then the patient begin's to bee ſomwhat better and more at eaſ. For ſo by the ſtrength of nature, the tumor cauſing the pain is carried from within outwards. But of what nature ſoever the matter which cauſeth the pain bee, it is convenient to intercept the courſ thereof with *Empl. contra rupturam*, made with pitch and maſtick, and applied to the temple on that ſide where the tooth asketh.

CHAP. XXVI.

Of other affects of the Teeth.

Cauſes of looſneſs of the teeth.

THe teeth are alſo troubled with other preternatural affects. For ſomtimes they ſhake by relaxation of the gums, or elſ beecom corrupt and rotten, or have worms in them, or elſ are ſet on edg. For the firſt, the gums are relaxed either by an external or primitive cauſ, as a fall or blow: or elſ by an internal or antecedent, as by the defluxion of acrid or wateriſh humors from the brain, or through want of nouriſhment in old bodies. If the teeth grow looſ by the means of the decaying gums, the diſeaſ is then incureable; but you may withſtand the other cauſes by the uſe of ſuch things as faſten the teeth, ſtunning on the contrarie ſuch as may looſen them.

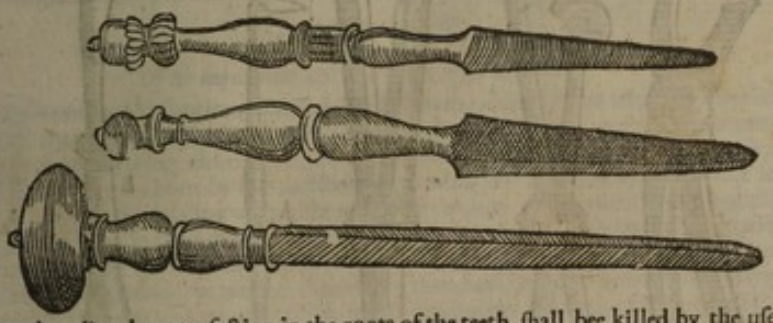
There-

Therefore the patient must not speak too earnestly, neither chaw hard things. If they becom loos by a fall or blow, they must not bee taken forth, but restored and fastened to the next that remain firm, for in time they will bee confirmed in their sockets, as I tried in *Antonie de la Rue* a Tailor, who had his jaw broken with the pommel of a dagger, and three of his teeth loosened, and almost shaken out of their sockets; the jaw beeing restored, the teeth were also put in their places, and bound to the rest with a double waxed thred; for the rest, I fed the patient with broths, gellies, and the like, and I made astringent gargarisms of cypress-nuts, myrtle-berries, and a little alom boil'd in oxycrate, and I wished him to hold it a good while in his mouth: by these means I brought it so to pass, that hee within a while after could chaw as easily upon those teeth, as upon the other. I heard it reported by a credible person, that hee saw a Ladie of the prime Nobilitie, who instead of a rotten tooth shee drew, made a sound tooth, drawn from one of her waiting-maids at the same time, to bee substituted and inserted, which tooth in process of time, as it were taking root, grew so firm, as that shee could chaw upon it as well as upon anie of the rest. But as I formerly said, I have this but by hear-say. A Historie.

Now the teeth are corroded or eaten in by an acrid and thin humor penetrating by a plenteous and frequent defluxion even to their roots, and beeing there contained, it putrefie's, and becoming more acrid, it doth not onely draw the teeth into the contagion of its putrefaction, but also perforate's and corrode's them. The causes of hollow teeth.

The putrefaction may bee corrected, if after general medicines, you put oil of vitriol or *aqua fortis* into the hole of the eaten tooth: or else, if you burn the tooth it self to the root with a small iron wier beeing red hot: you shall thrust this hot iron thorow a pipe or cane made for the same purpose, least it should harm any sound part by the touch thereof, and thus the putrefaction, the cause of the arrosion, may bee staied. But if the hole bee on the one side between two teeth, then shall you file away so much of the sound tooth, as that you may have sufficient libertie to thrust in your wier without doing anie harm. The cure.

The forms of Files made for filcing the teeth.



Worms breeding by putrefaction in the roots of the teeth, shall bee killed by the use of causticks, by gargles or lotions made of vineger, wherein either pellitorie of Spain hath been steeped, or treacle dissolved; also aloës and garlick are good to bee used for this purpose. Causes of worms in the teeth.

Setting the teeth on edg happen's to them by the immoderate eating of acrid or tart things, or by the continual assent of vapors endued with the same qualitie, from the orifice of the ventricle to the mouth, or by a cold defluxion, especially of acrid phlegm, falling from the brain upon the teeth, or else by the too excessive use of cold or stupifying liquors. This affect is taken away, if after general medicines and shunning those things that cherish the disease, the teeth bee often washed with *aqua vitæ*, or good wine, wherein sage, rosemarie, clovs, nutmegs, and other things of the like nature have been boiled. Causes of setting the teeth on edg.

CHAP. XXVII.

Of drawing of Teeth.

TEeth are drawn, either for that they caus intolerable pains, which will not yeeld to medicines, or else for that they are rotten and hollowed, so that they caus the breath to smell; or else, for that they infect the sound and whole teeth, and draw them into the like corruption, or becaus they stand out of order. Besides, when they are too deep and strongly rooted, so that they cannot bee pluck'd out, they must oft-times bee broken of necessitie, that so you may drop som caustick thing into their roots, which may take away the sens, and consequently the pain. The hand must bee used with much moderation in the drawing out of a tooth; for the jaw is somtimes dislocated by the too violent drawing out of the lower teeth. But the temples, eies and brain are shaken with greater danger by the too rude drawing of the upper teeth. Wherefore they must first bee cut about, that the gums may bee loosed from them, then shake A caveat in drawing of teeth.

ſhake them with your fingers, and do this until they begin to bee looſe; for a tooth which is faſt in, and is plucked out with one pull, oft-times break's the jaw, and bring's forth the piece together therewith, whence follow's a fever and a great flux of blood not eaſily to bee ſtaied (for blood or *pus* flowing out in great plentie is, in *Celſus's* opinion, the ſign of a broken bone) and manie other malign and deadlie ſymptoms: Som have had their mouths drawn ſo awrie, during the reſt of their lives, ſo that they could ſcarce gape. Beſides, if the tooth bee much eaten, the hole thereof muſt bee filled either with lint, or a cork, or a piece of lead well fitted thereto, leſt it bee broken under your *forceps*, when it is twitched more ſtraightly to bee plucked out, and the root remain, readie in a ſhort time to cauſ more grievous pain. But judgment muſt bee uſed, and you muſt take ſpecial care, leaſt you take a ſound tooth for a pained one; for oft-times the patient cannot tell, for that the bitterneſs of pain by neighborhood is equally diffuſed over all the jaw. Therefore for the better plucking out a tooth, obſerving theſe things which I have mentioned, the patient ſhall bee placed in a low ſeat, bending back his head between the tooth-drawer's legs; then the tooth-drawer ſhall deeply ſcarifie about the tooth, ſeparating the gums there-from with the inſtruments marked with this letter A. and then if ſpoiled as it were of the wall of the gums, it grow looſ, it muſt bee ſhaken and thruſt out, by forceing it with the three-pointed levatorie noted with this letter B. but if it ſtick in too faſt, and will not ſtir at all, then muſt the tooth bee taken hold of with ſom of theſe toothed *forcipes* marked with theſe letters C.D.E. now one, then another, as the greatneſs, figure, and ſite ſhall ſeem to require. I would have a tooth-drawer expert and diligent in the uſe of ſuch toothed mullets; for unleſs one know readily and cunningly how to uſe them, hee can ſcarce ſo carrie himſelf, but that hee will force out three teeth at once, oft-times leaving that untouch't which cauſed the pain.

Lib. 7. cap. 18.

The maner of drawing teeth.

Inſtruments for ſcrapeing the teeth, and a three-pointed levatorie.

The effigies of Forcipes, *or Mullets for the drawing of teeth.*

The form of another Inſtrument for drawing of teeth.

What to bee don when the tooth is pluck't out.

After the tooth is drawn, let the blood flow freely, that ſo the part may bee free'd from pain, and the matter of the tumor diſcharged. Then let the tooth-drawer preſs the fleſh of the gums on both ſides with his fingers whereas hee took out the tooth, that ſo the ſocket that was too much dilated, and oft-times torn by the violence of the pluck, may bee cloſed again. Laſtly, the mouth ſhall bee waſhed with oxycrate; and if the weather bee cold, the patient ſhall take heed of going much in the open air, leaſt it cauſa new defluxion upon his teeth.

CHAP.

CHAP. XXVIII.

Of cleansing the Teeth.

Peeces of meat in eating somtimes stick between the teeth, and becoming corrupt by long staying there, do also hurt the teeth themselvs, and spoil the sweetness of the breath. Hee that would eschue this, ought presently after meat to wash his mouth with wine mixed with water, or oxycrate, and well to cleans his teeth, that no slimie matter adhere to them. Manie folks teeth by their own default gather an earthie filth of a yellowish color, which eat's into them by little and little, as rust eat's into iron. This rustie filthiness, or as it were mouldiness of the teeth, doth also oft-times grow by the omitting of their proper dutie, that is, of chawing. Whence soever this slimie filth proceed's, wee must get *Dentifrices* to fetch it off withall, and then the teeth must bee presently rubbed with *aqua fortis* and *aqua vitæ* mixed together, that if there bee anie thing that hath scaped the *Dentifrices*, it may bee all fetched off; yet such acrid washings are hurtful to the sound teeth, for that they by little and little consume and waste the flesh of the gums.

Causes of foul or rustie teeth.

The cure.

A caution in the use of acrid things.

Dentifrices shall bee made of the root of marsh-mallows boiled in white wine and allom; and, as when the teeth are loos, wee must abstain from such things as are hard to bee eaten & chawed, but much more from breaking of such things as are of a bonie consistence, so also heer wee must shun all things that by their toughness stick to the teeth. Manie for the cleansing of the teeth, commend a powder made of scuttle-bones, purple-shells, pumice-stone, burnt allom, and Hart's-horn, and a little cinnamon, which is a singular remedie for the teeth howsoever affected. Manie other are content with bread onely tosted and beaten; but this following water is verie effectuall to whiten the teeth. ℞. *sal.ammon. & gemmei, an.* ℥i. *alum.roch.* ℥ß. *aquæ ros.quod sufficit, distillentur.* And let the teeth bee cleansed with this distilled liquor.

A water to whiten the teeth.

CHAP. XXIX.

Of the impediment and contraction of the Tongue.

The tongue is somtimes tied and short from the nativitie; as when the libertie of the tongue is restrained by the subject and neighboring, as well membranes as muscles, being either too short or too hard. Somtimes this disease happen's after they are born by som accident or preternatural affect, as by too hard a scar left by the healing of an ulcer under the tongue. The patient at his begining to speak, is too slow in speaking, but presently leaving his slowness, hee becom's too quick, so that hee stammer's. If the disease proceed from the astriction and shortness of the ligamental membrane lying under the tongue, then the incision shall bee made broad-wise, having great care that the veins and arteries which are there, bee not violated, for fear least they should caus an *hemorrhagie*, not easily to bee staied: Then the mouth shall bee presently washed with oxycrate, and som lint dipped in syrup of dried roses, or honie of roses put into the midst of the incision, least the part of the ligament, especially on the night time when the tongue is silent and at rest, should grow to the rest of the ligament. For the same purpose the finger shall bee often thrust this way, and the tongue more violently rowll'd up and down, and thrust out of the mouth. Yet somtimes this ligament is so thick and short, and therefore hold's down the tongue so close, that you cannot com to cut it with a knife or lancet without great and manifest danger of death by bleeding. Therefore in such a case a needle and thred shall bee thrust through it, and so the thred shall bee tied straighter and straighter everie day, until by little and little this ligamental tie of the tongue, which by its immoderate shortness intercept's the libertie of the motion shall bee consumed and broken.

The cause of being tongue-tied.

The cure.

Another way to cut it.

CHAP. XXX.

Of superfluous Fingers, and such as stick together.

Each hand hath naturally five fingers onely; whatsoever is more or less is against nature: and if there bee fewer, it is a fault not to bee helped by art. But if there bee more, that for the most part may bee helped by art: superfluous fingers usually grow by the thumb, or the little finger, but seldom otherwise. These are either wholly fleshie, or have bones of their kinde and nails upon them. Those which are of a bonie nature doe either arise from the joints of the natural fingers, and are jointed like them, and so are oft-times moovable, or elf from som middle space of a joint, and these have not power to stir or moov. Now they are somtimes

The differences.

equal

equall in magnitude to the natural fingers to which they grow, yet more frequently they are ſhorter. Thoſe which are onely fleſhie, are eaſily amputated and made even with a razor; but ſuch as are alſo bonie cannot bee cut off, unleſs with the cutting mullets hereafter deſcribed, and this is a diſeaſ of the fingers in number. There is alſo another diſeaſ in fingers, for they ſomtimes ſtick together, and otherwhiles they are verie little ſeparated. This fault happen's either from the firſt original, by the error of the formative faculties; or elſ it happen's afterwards by accident, as by a wound, or burn ill cured. For neighboring fingers being ulcerated do eaſily grow together, unleſs they bee kept aſunder by a linnen rag. And if they by chance ſhall grow together by a little and thin skin and fleſh, they ſhall forthwith bee divided with a ſharp razor; but if they bee joined by the interpoſition of a more groſs and denſ ſubſtance, to wit, the nerve, tendons, and veſſels, being knit together on each ſide, it will bee beſt not to meddle at all with the divideing them.

Cutting Mullets neatly made for the cutting off ſuperflous fingers.

The cure of nails runing into the fleſh of the fingers.

Neither muſt wee omit, that manie have their nails run with ſuch bonie ſharpneſs into the fleſh of their fingers lying under them, that they cauſ moſt cruel pain; neither commonly do you avail anie thing by pareing them; for growing up within a while after, they preſs downwards again with the more violence. Therefore the Surgeon is often forced to cut away all the fleſh whereinto the ſharpneſs of the nail run's. Which I have don in manie with happie ſucceſs. Manie have corns growing upon their fingers in divers faſhions: They are taken off by paring away by little and little the callous hardneſs, and then laying a head of garlick beaten thereon. Yet the cure is more quick and certain, which is performed by cauſticks, as *aqua fortis*, or oil of vitriol.

How to take off the corns of the fingers.

CHAP. XXXI.

Of the too ſhort a Prepuce, and of ſuch as have been circumciſed.

The cauſ.

When as the Prepuce or fore-skin is too ſhort, it cannot cover the *Glans*. This happen's either by nature, to wit, by the firſt conformation, or afterwards by ſom accident, as to thoſe whom religion and the cuſtom of their nation bid's to bee circumciſed.

The cure.

The cure is thus: The Prepuce is turned up, and then the inner membrane thereof is cut round, and great care is had, that the vein and arterie which are there between the two membranes of the Prepuce bee not cut in ſunder. Hence it is drawn downward by extenſion, until it cover the *Glans*, a deſiccative emplaſter beeing firſt put between it and the *Glans*, leaſt they ſhould grow together. Then a pipe being firſt put into the urinarie paſſage, the Prepuce ſhall bee there bound until the inciſion bee cicatrized. This cure is uſed to the Jews, when having abjured their religion full of ſuperſtitions, for handſomneſs ſake, they would cover the nut of their yard with a Prepuce, and ſo recover their cut offs-kin.

CHAP. XXXII.

Of Phimoſis *and* Paraphimoſis, *that is, ſo great a conſtriction of the Prepuce about the* Glans *or Nut, that it cannot bee barred or uncovered at pleaſure.*

The prepuce is ſtraightened about the *Glans* two waies; for it either cover's the whole nut, and ſo ſtraightly encompaſſe's the end thereof, that it cannot bee drawn upwards,

and

and consequently the nut cannot bee uncovered; or elſ it leav's the *Glans* bare under it, being faſtned ſo ſtiffly to the roots thereof, that it cannot bee turned up, nor drawn down, or over the *Glans*. The firſt manner of conſtriction is termed *Phimoſis*, the later *Paraphimoſis*. The cauſes. The *Phimoſis* happen's either by the fault of the firſt conformation, or elſ by a ſcar, through which occaſion the prepuce hath grown leſſer, as by the growing of warts. Now *Paraphimoſis* is often occaſioned by the inflammation of the yard, by impure copulation; for hence ulcers breed between the prepuce and *Glans*, with ſwelling, and ſo great inflammation, that the prepuce cannot bee turned back. Whence it is that they cannot bee handled and cured as you would, and a gangrene of the part may follow, which may by the contagion bring death to all the bodie, unleſs it bee hindered and prevented by amputation: but if a ſcar bee the cauſ of the conſtriction of the prepuce, the patient beeing plac'd in a convenient ſite, let the prepuce bee drawn forth and extended, and as much as may bee ſtretched and enlarged, then let the ſcar bee gently cut in three or four places on the inner ſide with a crooked knife, but ſo, that the gaſhes com not to the outſide, and let them bee an equal diſtance each from other. But if a fleſhlie excreſcence or a wart ſhall bee the occaſion of this ſtraitneſs and conſtriction, it ſhall bee conſumed by the ſame remedies, by which the warts of the womb and yard are conſumed or taken off. But when as the prepuce doth cloſely adhere to the *Glans* on everie ſide, the cure is not to bee hoped for, much leſs to bee attempted. The cure.

CHAP. XXXIII.

Of thoſe whoſe Glans *is not rightly perforated, and of the too ſhort or ſtrait ligament, bridle, or cord of the yard.*

SOm at their birth, by evil conformation, have not their *Glans* perforated in the middle, but have onely a ſmall hole underneath, toward the bridle and ligament of the yard, called the cord. Which is the cauſ, that they do not make water in a ſtrait line, unleſs they turn up their yard toward their bellie, neither by the ſame reaſon can they beget children, becauſ through this fault of conformation, the ſeed is hindered from beeing caſt directly into the womb. The cure is wholly chirurgical, and is thus performed. The prepuce is taken hold of and extended with the left hand, but with the right hand, the extremitie thereof, with the end of the *Glans*, is cut even to that hole which is underneath. But ſuch as have the bridle or ligament of the yard too ſhort, ſo that the yard cannot ſtand ſtraight, but crooked, and as it were turned downwards; in theſe alſo the generation of children is hindered, becauſ the ſeed cannot bee caſt directly and plentifully into the womb. Therefore this ligament muſt bee cut with much dexteritie, and the wound cured after the manner of other wounds, haveing regard to the part. The cauſ. The cure.

Children alſo are ſomtimes born into the world with their fundaments unperforated, for a skin preternaturally covering the part, hinder's the paſſage forth of the excrement; thoſe muſt have a paſſage made by art with an inſtrument, for ſo at length the excrements will com forth: yet I have found by experience, that ſuch children are not naturally long live'd, neither to live manie daies after ſuch ſection. Such as are born without a hole in their fundament are not long lived.

CHAP. XXXIV.

Of the cauſes of the Stone.

THe Stones which are in the bladder have for the moſt part had their firſt original in the reins or kidnies, to wit, falling down from thence by the ureters into the bladder. The cauſ of theſe is twofold, that is, material and efficient. Groſs, tough, and viſcid humors, which crudities produce by the diſtempers of the bowels and immoderate exerciſes, chiefly and immediately after meat, yeeld matter for the ſtone; whence it is that children are more ſubject to this diſeaſ then thoſe of other ages. But the efficient cauſ is either the immoderate heat of the kidnies, by means whereof the ſubtler part of the humors is reſolved, but the groſſer and more earthlie ſubſide's, and is hardned as wee ſee bricks hardned by the ſun and fire; or the more remiſs heat of the bladder, ſufficient to bake into a ſtone the *feces* or dregs of the urine gathered in great plentie in the capacitie of the bladder. The ſtraightneſs of the ureters and urenarie paſſage may bee accounted as an aſſiſtant cauſ. For by this means the thinner portion of the urine floweth forth, but that which is more feculent and muddie being ſtaied behinde, groweth as by ſcale upon ſcale, by addition and collection of new matter into a ſtonie maſs. And as a wieke oftentimes dipped by the Chandler into melted tallow, by the copious adheſion of the tallowie ſubſtance preſently becom's a large candle; ſo the more groſs and viſcid *fecis* of the urine ſtay as it were at the bars of the gathered gravel, and by their continual appulſ are at length wrought and faſhioned into a true ſtone. Why children are ſubject to the ſtone in the bladder. The cauſ.

CHAP.

CHAP. XXXV.

Of the ſigns of the Stone in the Kidnies and Bladder.

Why the thigh is numm in the ſtone of the reins.

THe ſigns of the Stone in the Reins, are the ſubſideing of red or yellow ſand in the urine, a certain obſcure itching at the kidnies, and the ſenſ of a weight or heavineſs at the loins, a ſharp and pricking pain in mooving or bending the bodie, a numneſs of the thigh of the ſame ſide, by reaſon of the compreſſion cauſed by the ſtone, of the nervs deſcending out of the *vertebræ* of the loins of the thigh.

Signs of the ſtone in the bladder.

But when the ſtone is in the bladder, the fundament and whole *perineum* is preſſed as it were with a heavie weight, eſpecially if the ſtone bee of anie bigneſs, a troubleſom and pricking pain run's to the verie end of the yard, and there is a continual itching of that part, with a deſire to ſcratch it: hence alſo by the pain and heat there is a tenſion of the yard, and a frequent and needleſs deſire to make water, and ſomtimes their urine cometh from them drop by drop. A moſt grievous pain torment's the patient in makeing water, which hee is forced to ſhew hy ſtamping with his feet, bending of his whole bodie, and the grateing of his teeth.

Why ſuch as have a ſtone in the bladder are troubled with the falling of the fundament.

Hee is oft-times ſo tormented with exceſs of pain, that the *Sphincter* beeing relaxed, the right gut falleth down, accompanied with the ſwelling heat and pain of the *Hemorhoid* veins of that place. The cauſ of ſuch torment is, the frequent ſtriveing of the bladder to expel the ſtone wholly contrarie to the nature thereof, whereto by ſympathie the expulſive facultie of the guts and all their parts of the bellie com as it were for ſupplie. The ſediment of the urine is groſs and viſcid, and oft-times like the whites of eggs, which argueth the weakneſs of the native heat not attenuateing the juices. The patient looketh of a pale and yellowiſh complexion and hollow-eied, by reaſon of the almoſt continual watching which is cauſed by the bitterneſs of pain; yet may it more certainly bee known by putting in or ſearching with a *Catheter*.

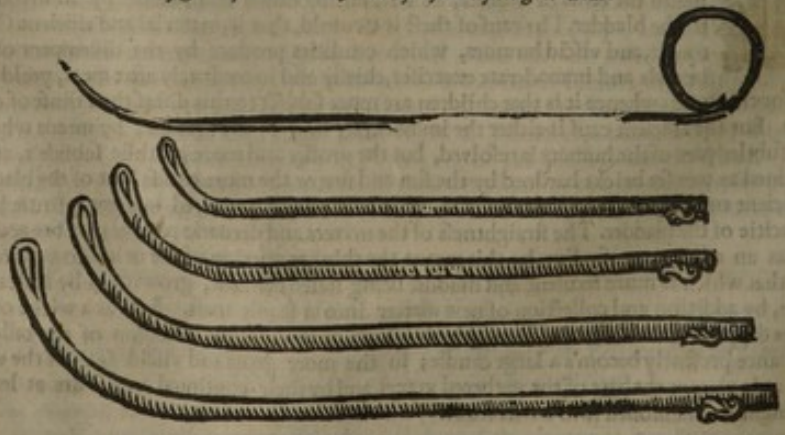
How to ſeech for the ſtone in the bladder with a *Catheter*.

Which to do, the patient ſhall bee wiſhed to ſtand with his bodie ſomwhat ſtooping, leaning againſt ſomwhat with his back, and holding his knees ſom foot aſunder. Then the *Catheter* beeing bigger or leſſer as the bodie ſhall require, and anointed with oil or butter ſhall bee thruſt with a skilful hand into the paſſages of the urine, and ſo into the capacitie of the bladder. But if the *Catheter* cannot com to that capacitie, the patient ſhall bee placed in ſuch a poſture; then ſhall hee bee laid upon his back on a bench, or the feet of a bed, with his knees bended, and his heels drawn to his buttocks, after which manner hee muſt almoſt lie when hee is to bee cut for the ſtone, as ſhall bee ſhew'n hereafter. For thus the *Catheter* is more eaſily thruſt into the bladder, and ſhew's there is a ſtone by the meeting and obſcure ſound of the obvious, hard and reſiſting bodie. You muſt have ſundrie *Catheters*, that they may ſerv for everie bodie bigger and leſſer, and theſe muſt bee crooked, ſmooth and hollow. When being thruſt into the urinarie paſſage (which before unawares I omitted) they com to the neck of the bladder, they muſt not bee thruſt ſtraight into the bladder; but takeing hold of the yard with the left hand, they muſt bee gently thruſt with the right directly into the bladder, eſpecially in men, by reaſon of the length and crookedneſs of the way, which tend's in the form of this letter S.

The figure of the neck of the bladder is different in men and women.

It is not ſo in women by reaſon of the ſhortneſs and ſtraitneſs of the neck of the bladder. It is fit your *Catheters* bee hollow or fiſtulous in manner of a pipe, that they may receiv a ſilver wiar or ſtring, that may hinder the groſs and viſcid humor, clotted blood, or the like, from ſtopping the further end of the *Catheter*, through which the ſuppreſſed urine ought to paſs and bee made. But now aſſoon as wee perceiv that the *Catheter* is com into the capacitie of the bladder, the wiar muſt bee drawn forth, that ſo the urine may the freelier flow out by the hollowneſs of the *Catheter*. You may perceiv the ſhapes of theſe inſtruments by this following figure.

The figure of Catheters, *and of a ſilver ſtring or wiar.*



CHAP.

CHAP. XXXVI.

Prognosticks in the Stone.

WHen the Stone is cast forth of the kidnie (whereas it bred by little and little) and is so driven into one of the ureters, that it wholly stop it, yet thereupon there followeth no suppression of the urine; for seeing nature hath made diverse parts of our bodie double, all the urine floweth into the other ureter. But if they shall bee both stopped with stones, there is no doubt but the urine will bee wholly suppresst, and death ensue by the suffocation and extinction of the native heat, by the urine flowing back by the rivelets of the veins over all the whole bodie. Such as have a small stone cast forth of their reins into the cavitie of the uterers, these, untill this stone bee fallen into the bladder, have cruel pain with gripeings, with often desire to go to stool and make water, but oft-times do neither. For such oft-times have their bellies distended with flatulencies: an argument hereof is their continual belching or breaking of winde. But by sneesing and coughing, or anie other concussion of the whole bodie, a pricking pain is forthwith felt, whereas the stone stop's, especially if it bee either rough, or have sharp points like horns. This pain is communicated to the hip and thigh by sympathie, and som have the stones drawn up as it were with great violence. To these may bee added the Colick, cholerick vomiting, and almost a general sweat. The stone in the kidnies is most commonly bred in such as are antient, by reason of the weakness of the expulsive facultie. But the stone in the bladder happeneth to such as are more young, becaus the native heat is more vigorous in such, and strong and inordinate motions encreas the strength of the expulsive facultie. When the stone is in the bladder, and the urine appeareth bloodie, it is the sign of a small, as also a pricklie and rough stone, for thus it more easily entreth into the neck of the bladder, and exulcerateth it beeing fleshie, whence the blood cometh away with the urine, and most cruel pain as of needles thrust into the flesh, especially after labor and much exercise: on the contrarie, a larger and more smooth stone will not caus such tormenting pain, and it causeth a milkie water. The shapes of stones in the kidnies are various, according to the varietie of the strainers through which they pass whil'st they are bred. Verily I have seen stones which represented the figure of grayhounds, hogs and other creatures, and things wholly contrarie to man's nature, by the production of their prickles and as it were branches. Som are four square, others longish and like a finger, other som of a round figure with manie protuberancies like a pine-apple kernel; neither is the varietie less in magnitude, number and color: for som are yellowish, others whitish, red, ash-colored or som other like, according to the various temper of the affected bodies. The stones of cholerick and lean men visually concrete by preternatural heat and drieness; but those of phlegmatick or fat bodies, of a certain congelation as it were and obstruction of the passages. A stone falling sometimes from the bottom of the bladder into the passages of the urine quite stop's it up, and thence followeth a total suppressing of the urine. Therefore then the patient shall bee placed upon his back and his legs beeing lifted up on high, hee shall bee shaken and tossed up and down, just as one would shake up a sack to fill it; for thus it is forced back into the bladder from whence it came, from the passage of the urine whereinto it was got; yet it may also bee forced back by thrusting in a Catheter. The pain which afflicteth such as have the stone is somwhiles continual, yet more frequently it cometh by fits and returns, somtimes monthly, otherwhiles yearly. Such as have the stone in the kidnies make for the most part waterish urine. Women are not so subject to the stone as men, for they have the neck of their bladder more short and broad, as also more straight; wherefore the matter of the stone by reason of the shortness of the passage is evacuated in gravel, before it can bee gathered and grow into a stone of a just magnitude; yet stones breed in som women and those equally as big as in men, and therefore they are to bee cured by section and the like remedies. When the stone exceedeth the bigness of an egg, it can sarce bee taken away without tearing of the bladder, whence happeneth an unvoluntarie shedding of the water, cureable by no art, becaus the bladder, seeing it is nervous and without blood, beeing once torn admitteth no consolidation, add hereto that inflamation and a gangrene, often following the rending of the bladder, bring inevitable death. The patient run's the same hazzard, if a long stone bee pulled out sidewise with your instrument, or if it bee inclosed in a membrane (which kinde of stone can scarce bee found with a Catheter) and so bee fastned to the bladder, or otherwise if the stone it self bee fastned into the substance of the bladder, or lastly if by anie chance the Surgeon beeing about to pluck out the stone shall hurt the bodie of the bladder with his instruments. Yet stones of a more indifferent bigness are more safely extracted out of the bladder then those which are less, and the patient more frequently and happily recovereth. For they do not scape from the instrument, and the patient beeing used a long while to endure pain, as that which hath been a long time a growing doth more easily and constantly away with the inflamation, pain and other symptoms which happen after cutting, yea in cutting. Haveing thus spoken of the causes, signs, places, symptoms and pro-

How death may ensue by the suppressing of urine.

Why stones of the kidnies have sundrie shapes.

Why men are more subject to the stone then women.

What stones cannot bee taken out of the bladder without killing the patient.

prognoſticks, wee muſt com to the cure, begining with that part which is termed *Prophylactice*, that is the preventing part.

CHAP. XXXVII.

What cure is to bee uſed when wee fear the Stone.

What diet ſuch muſt uſeas fear the ſtone.

Diet muſt firſt bee appointed, which by the convenient uſe of the ſix things not natural (as they term them) may heap up ſmall ſtore of groſs, tough and viſcid humors in our bodies. Therfore cold and cloudie air is to bee ſhunned. They muſt abſtain from fiſh, beef, pork, water-foul, pulſ, cheeſ, milk-meats, fried and hard eggs, rice, cakes and all paſtrie, unlevened bread, and laſtly, all manner of obſtructing meats. Alſo garlik, onions, leeks, muſtard, ſpices, and laſtly, all things which over-heat the blood and humors muſt bee ſhunned, eſpecially if you fear that the ſtone is concrete by the heat of the reins. Standing and muddie waters, thick and troubled wines, beer, aud ſuch kinde of liquors muſt bee eſchewed. Satietie in meats and drinks is to bee ſhunned, as that which breed's crudities. Alſo long watching and continual labor becauſ they inflame the blood, cauſ crudities, and preternatural heat muſt carefully bee eſchewed, as alſo more vehement paſſions of the minde. If the bodie bee plethorick, then it muſt bee evacuated by phlebotomie, purgeing and vomiting, which is accounted for a ſingular remedie for the prevention of this diſeaſ. For the performance of all which things a Phyſician ſhall bee conſulted with. But becauſ Phyſicians are not in everie place and alwaies as hand, I have thought good to ſet down theſe following medicines; yet wee *Lib. 13. method.* muſt firſt remember this counſel of *Galen*; the uſe of diureticks, and ſtrong purgeing medicines is hurtful, as often as there is inflammation in the reins and bladder, for ſo the conflux of the humors to the affected parts is the greater, whence the inflammation and pain are increaſed.

Wherefore firſt uſeing relaxing medicines, as ſix drams of *Caſſia* newly drawn, with ℥iv. of *Rubarb* in powder mixed therewith; then lenitive and refrigerating medicines ſhall bee inwardly and outwardly uſed, ſuch as is this following ſyrrupe. R. *ſummitatum malv. biſmal. & violar. an.* m.ß. *rad. alth.* ℥i. *glycyr.* ℥ß. 4. *ſem. frigid. major. an.* ℥i. *fiat decoctio.* R. *prædict. decoctionis* ℔ ß. *in colaturâ diſſolve ſacc. albiſſ.* ℥ii. *mellis albi* ℥iß. *fiat ſyrupus ſecund. artem*; let the patient uſe this often. This following apozeme is alſo verie effectual for the ſame purpoſe. R. *rad. aſpar. gramin. polyp. quercini, paſſul. mund. an.* ℥ß. *betonic. berniar. ægrimon. omnium capill. & pimpinel. an.* m. ß. 4. *ſem. frigid. major. & ſem. fœnic. an.* ℥i. *folior. ſen.* ℥vi. *fiat decoct. ad* ℔ß.ß. *in colaturâ diſſolve ſyrupi de Althæa & de berniar. an.* ℥iß. Make a clear apozeme and let it bee aromatized with a little cinnamon, for two doſes; let him take the firſt doſis in the morning two hours before meat, and the other at four of the clock in the afternoon. Moreover this following broth hath an excellent and certain power to prevent the ſtone. R. *hordei integr.* p.i. *radic. petroſelini, aceroſ. fœnic. cichor. bruſci an.* ℥i. 4. *ſem. frigidorum conquaſſatorum an.* ℥ß. *fol. aceroſ. portul. lactucæ, ſummitatum malvæ, & violar. an.* m.ß. *bulliant in aquâ fluviatili cum gallo gallinaceo & crure vitulino*; let the broth bee kept, and let the patient take thereof ſix ounces for four daies; in the morning two hours before meat, with an ounce of the juice of Citrons gently warmed with the ſame broth at the takeing thereof; for thus, much urine will bee made in a ſhort while after, full of a ſandie ſediment and a groſs viſcid humor. Whereby you may certainly gather, that this kinde of broth is verie effectual to cleanſ the paſſages of the urine, neither in the interim, doth it anie harm to the ſtomack and other parts by which it paſſeth: ſo that it may bee rightly termed a medicinal nouriſhment. You may alſo profitably uſe this following powder. R. *nucleorum meſpilorum* ℥i. *pul. elect. diamarg. frig.* ℥ii. 4. *ſem. frigid. majorum mund. glycyrhizæ raſæ,* ℥i. *ſem. ſaxifrag.* ℥ii. *ſem. milii ſolis, geniſt. pimpin. bruſci & aſparag. an.* ℥i. *ſem althææ,* ℥.ß. *ſacch. albiſſ.* ℥vi. *fiat pulvis*; let him take a ſpoonful in the morning three hours before meat. Alſo ſom think that lee made of the ſtalks and huſks of beans is a good preſervative againſt this diſeaſ. Beſides the uſe of this following glyſter hath done good to manie. R. *fol. lactuc. ſcariol. portul. an* m.i: *flor. viol. & nenuph. an.* p.i. *fiat decoctio. ad lib.*i. *in colaturâ diſſolve caſſiæ fiſtulæ* ℥i. *mellis viol. & ſacc. rub. an.* ℥iß. *olei viol.* ℥iiii. *fiat clyſter.* This which followeth is the fitter to aſſwage the pain. R. *flor. chamm. melil. ſummitat. anetb. berul. an.* p.ii. *fiat decoctio in lacte vaccino*; *in colaturâ diſſolve caſſiæ fiſtul. & ſaccar. alb. an.* ℥i. *vitellos ovorum num.* ii *olei anethini, & chamæm. an.* ℥ii. *fiat clyſter.* In the interim let the kidnies bee anointed on the outſide with *unguentum roſatum, refrigerans Galen.* and *populeon* uſed ſeverally, or mixed together, laying a double linnen cloth dipped in oxycrate. But if the concretion of the ſtone bee of a cold cauſ, the remedies muſt bee varied, as follow's: R. *terebinth. venet.* ℥i. *cort. citri* ℥ii. *aquæ coct.* ℥ii. *fiat potio.* Or elſ; R. *caſſiæ recent. extract.* ℥vi. *benedict. laxat.* ℥iii. *aq. fœnic.* ℥ii. *aq. aſparag.* ℥i. *fiat potio*; let him take it three hours before dinner: this following apozeme is alſo good. R. *rad cepet. bardan. & gram. an.* ℥iii. *biſmal. cum toto, beton. an.* m.ß. *ſem. milii ſolis, bardan. urtic. an.* ℥ii. *ſem melon. glycyrhiz. raſ. an.* ℥iiß. *ficus num.* 4. *fiat decoct. ad quart.* iii. *in expreſſâ collaturâ, diſſolve ſirup. de capban. & oxymilitis ſyllitici*

A lenitive and lubricateing ſyrrupe.

A diuretick Apozeme.

A diuretick and lenitive broth.

A diuretick powder.

The lee made of the aſhes of bean-ſtalks a diuretick.

Anodine glyſters in the ſtone.

Remedies againſt the ſtone of the kidnies coming form a cold cauſ.

litici an. ℥i. ß. *sacchar. albiſ.* ℥iii *fiat apozema pro trib⁹ doſibus, clariſicetur & aromatiz. cum* ℥i. *cinam. &* ℥ß. *sant. citrin.* let him take four ounces three hours before dinner. ℞. *rad. petroſel. fœnicul. an.* ℥i. *saxifrag. pimp. gram. & bardan. an.* m.ß. *quatuor seminum frig. major mundat. & milii. ſolis an.* ℥ii. *fiat decoctio. cape de colaturâ* ℔ ß. *in quâ diſſolve ſacch. rub. & ſyrup. capill. ven. an.* ℥i. ß. Let it bee taken at three doſes, two hours before meat. The following powder is verie effectual to diſſolv the matter of the ſtone. ℞. *ſem. petroſel. & rad. ejuſdem mundat. an* ℥ß. *ſem. cardui, quem colcitrapam vocant,* ℥i. let them bee dried in an oven or ſtone with a gentle fire, afterwards let them bee beaten ſeverally and make a powder, whereof let the patient take ℈i. ß. or two ſcruples with white wine, or chicken-broth faſting in the morning by the ſpace of three daies. Or, ℞. *coriand. præp.* ℈iv. *aniſ. marathri, gavor. alkakengi, milii ſolis, an.* ℥ii. *zinzib. & cinam. an.* ℈ii. *turbith. electi* ℥i. *cari* ℈ii. *galang. nucis moſchat. & lapid. judiaci an.* ℈i. *fol. ſennæ mund. ad duplum omnium, diacrydii* ℥ii. ß. *miſce, fiat pulvis :* the doſis is about ℥i. with white wine three hours before meat. Againſt the flatulencies which much diſtend the guts in this kinde of diſeaſ, glyſters ſhall bee thus made ; ℞. *malu. biſmal. pariet. origani, calament. flor. chamæm.* Carminative glisters. *ſumitat. anethi, an.* m. ß. *aniſi, carvi. cumini, fœnic. an.* ℥ß. *baccar. laur.* ℥iii. *ſem. rutæ* ℥ii. *fiat decoctio, in colaturâ, diſſolve bened. lax. vel diaphœnic.* ℥ß. *confect. bac. lauri* ℥iii. *ſacchar. rub.* ℥i. *olei aneth. chamæm. & rutar. an.* ℥i. *fiat clyſter.* Or, ℞. *olei nucum & vini mal. an.* ℔ ß. *aq. vitæ* ℥ß. *fiat clyſter ;* let it bee kept long, that ſo it may have the more power to diſcuſs the winde.

CHAP. XXXVIII.

What is to bee don, when the ſtone falleth out of the Kidnie into the Ureter.

OFt-times it falleth out that the reins uſeing their expulſive facultie force down the ſtone (whoſe concretion and generation the Phyſicians by the formerly preſcribed means could not hinder) from themſelvs into the ureters ; but it ſtaieth there either by reaſon of the ſtraightneſs of the place, or the debilitie of the expulſive facultie. Therefore then cruel pain tormenteth the patient in that place whereas the ſtone ſticketh, which alſo by conſent may bee communicated to the hip, bladder, teſticles and yard, with a continual deſire to make water and go to ſtool. In this caſe it behooveth the Phyſician that hee ſupplie the defect of nature, and aſſiſt the weak indeavors. Signs of the ſtone ſtopping in the *ureter*.

Therefore let the patient if hee bee able mount upon a trotting horſ, and ride upon him the ſpace of ſom two miles, or if hee can have no opportunitie to do ſo, then let him run up and down a pair of ſtairs untill hee bee wearie, and even ſweat again ; for the ſtone by this exerciſe is oft-times ſhaken into the bladder ; then preſently ſhall bee given or taken by the mouth ſuch things as have a lenitive and relaxing facultie, as oil of ſweet almonds newly drawn and that without fire, and mixed with the water of pellitorie of the wall and white wine. Let frictions of the whole bodie bee made from above downwards with hot clothes ; let Ventoſes with a great flame bee applied one while to the loins, and another while to the bottom of the bellie, a little below the grieved place ; and unleſs the patient vomit of his own accord, or by the bitterneſs of his pain, let vomiting bee procured with a draught of water and oil luke-warm; for vomiting hath much force to drive down the ſtone by reaſon of the compreſſiom of the parts, which is cauſed by ſuch an endeavor : Laſtly, if the ſtone deſcend not by the power of theſe remedies, then the patient muſt bee put into a *Semicupium*, that is a Half-bath, made of the following decoction. ℞. *malvæ, biſmal. cum toto an.* m. ii. *beton. naſtur. ſaxifrag. berul. parietar. violar. an.* m. iii *ſem. melonum, milii ſolis, alkekengi an.* ℥vi. *cicer. rub.* ℔ i. *rad. appii. gram. fœniculi, & eringii. an.* ℥iiii. *in ſufficienti quantitate aquæ pro inceſſu ; coquantur iſta omnia incluſa ſacco ;* herein let the patient ſit up to the navel : neither is it fit that the patient tarrie longer in ſuch a bath then is requiſite, for the ſpirits are diſſipated, and the powers reſolved by too long ſtay therein. But on the contrarie, if the patient remain as long as is ſufficient in theſe rightly made, the pain is mitigated, the extended parts relaxed, and the paſſages of the urine opened and dilated, and thus the ſtone deſcendeth into the bladder. But if it bee not mooved by this means any thing at all out of the place, and that the ſame total ſuppreſſion of urine do as yet remain, neither before the patient entred into the bath the putting of a *Catheter* into the bladder did any thing avail, yet notwithſtanding hee ſhall trie the ſame again after the patient is com out of the bath, that hee may bee throughly ſatisfied whether peradventure there may bee anie other thing in theſe firſt paſſages of the yard and neck of the bladder, which may with-hold the urine ; for the *Catheter* will enter far more eaſily, the parts beeing relaxed by the warmneſs of the bath : then inject ſom oil of ſweet almonds with a ſyringe into the *Urethra* or paſſage of the yard ; whil'ſt all theſe things are in doing, let not the patient com into the cold air. But heer I have thought good to deſcribe a chair for a bath, wherein the patient may fitly ſit. Remedies to force down the ſtone ſticking in the *ureter*. A decoction for a bath.

The figure of a Chair for a Semicupium.

A. *Sheweth the whole frame of the Chair.*
B. *The hole wherein the patient muſt ſit.*
C. *The Ciſtern that holds the water.*
D. *A Cock to emptie the water when it groweth cold.*
E. *A Funnel whereby to pour in warm water.*

There may alſo bee another decoction made for the bath, as thus: ℞. *rad. raph. alth. an.* ℔ii. *rad. ruſc. petroſel. & aſparag. an.* ℔i. *cumin. fœnicul. ameos an.* ℥iiii. *ſem. lini, fœnug. an* ℥vi. *fol. marub. parietar. florum chamæm. melil. anethi. an.* m. ii. *bulliant omnia ſecundùm artem in aquæ ſufficienti, & vini albi odoriferi exiguâ quantitate ad conſumptionem tertiæ partis pro Semicupio.* Alſo the ſame decoction may bee uſed for gliſters, adding thereto two yolks of eggs, aud four ounces of oil of lillies, with ℥i. of oil of juniper, which hath a certain force to aſſwage the pain of the ſtone and collick. But a far leſs quantitie of the decoction in a gliſter muſt bee uſed in theſe diſeaſes, than uſually is appointed in other diſeaſes; otherwiſe there will bee danger leſt the guts beeing diſtended ſhould more preſs upon the kidnies and ureters, troubled in ſom ſort with inflammation, and ſo increaſe the pain and other ſymptoms. This following cataplaſm ſhall bee profitably applied to the grieved place, to wit, the loins or flanks and bottom of the bellie, for it is verie powerful to aſſwage pain, and held forwards the falling down of the ſtone. ℞. *rad. alth. & raphani, an.* ℥iiii. *pariet. fœnic. ſenecionis, naſturt. berul. an.* m. i. *berniariæ* m. ß. *omnibus in aquâ ſufficienti decoctis, & deinde contritis, adde olei anethi. chamæm. & pingued. cuniculi, an.* ℥ii. *farin. cicer. quantum ſufficit, fiat cataplaſma ad uſum prædictum.*

An anodine Cataplaſm.

Signs of the ſtone fallen out of the *ureter* into the bladder.

After, by theſe means, the ſtone forced out of the *ureter* is fallen into the bladder, the pain preſently (if there bee but one ſtone, for ſomtimes more with much gravel do again fall into the *ureter*) is mitigated, and then the patient is troubled with an itching and pricking at the end of his yard and fundament. Therefore then unleſs hee bee verie weak, it is fit that hee ride and walk a foot, and take ℥iv. of *ſpecies Lithontribon* in four doſes with white wine, or the broth of red Cicers three hours before dinner and ſupper. Beſides, let him plentifully drink good wine, and after hee hath drunk, let him hold in his urine as long as hee can; that ſo it beeing gathered in great plentie, it may preſently thruſt the ſtone out of the bladder with the more force; for which purpoſe you may alſo inject the following liquor into the bladder. ℞. *ſyrupi capill. ven.* ℥i. *aquæ alkekengi* ℥iii. *olei ſcorpionum.* ℥ß. Let it bee injected into the bladder with a ſyringe.

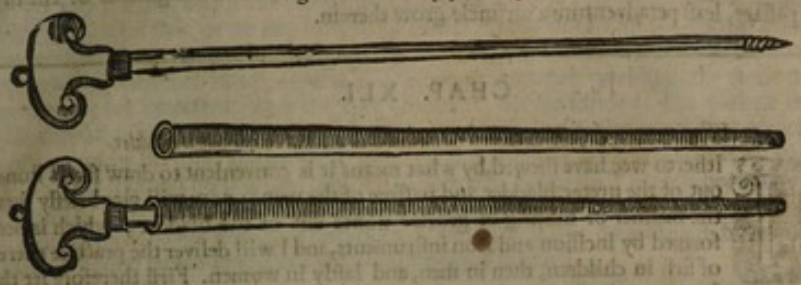
CHAP. XXXIX.

What muſt bee don the ſtone beeing fallen into the neck of the bladder, or paſſage of the yard.

After the ſtone is fallen out of the capacitie of the bladder, and ſtop's in the neck thereof, or paſſage of the yard, the Surgeon ſhall have a ſpecial care that hee do not force or thruſt back the ſtone from whence it came, but rather that hee preſs it gently with his fingers to the end of the yard, the paſſage beeing firſt made ſlipperie by injecting ſom oil of ſweet almonds. But if it ſtop in the end of the *Glans*, it muſt bee plucked out with ſom crooked inſtrument; to which if it will not yeeld

yeeld, a Gimblet with a pipe or case thereto, shall bee put into the passage of the yard, and so it shall bee gotten out, or elſ broken to pieces by the turning or twining about of the Gimblet, which I remember I have divers times attempted and don; for such Gimblets are made with sharp scrues, like ordinarie gimblets.

The delineation of a Gimblet made to break the stones in the passage of the yard, together with its pipe, or case.



The effigies of another lesser Gimblet.

Verily what Gimblets soever are made for this business, their bodie or point must bee no thicker then a small *probe*; least whil'st they are forced or thrust into the *Urethra*, or urinarie passage, they might hurt the bodies next unto them by their violent entrance.

CHAP. XL.

What course must bee taken, if the stone sticking in the Urethra, *or urinarie passage, cannot bee gotten out by the fore-mentioned arts.*

BUt if the stone bee more thick, hard, rough and remote from the end of the yard, then that it may bee gotten out by the means formerly mentioned in the precedent Chapter, and if that the urine bee wholly suppreſt therewith; then must you cut the yard upon the side with a straight wound: for you must not make incision on the upper part, for fear of a flux of blood, for a large vein and arterie lieth there-under; nor in the lower part, for so it would scarce ever heal again, for that it is a bloodless part, and besides, the continual and acrid falling of the urine would hinder the agglutination: wherefore the incision must bee made on the side, on that part whereas the stone most resist's and swell's out. For that part is the more fleshie; yet first the end of the skin of the prepuce must bee much drawn up so to cover the *Glans*, which beeing don, the *Urethra* shall bee tied with a thred a little above the stone, that so the stone may bee staied there, and may not fall back again. Therefore then, incision beeing made, the stone must bee taken forth, and the skin which was drawn more violently to cover the *Glans*, is to bee let go back again; for so it will com to pass that a whole part of the skin may cover the cut-yard, and so it may bee the more speedily united, and the urine may naturally flow out. I have by this means oft-times taken forth the stone with the instruments heer delineated. When the yard may bee safely cut.

Instruments fit to take the stone forth of the opened Urethra, *or urinarie passage of the yard.*

An agglutinative medicine.

Then for the agglutination, if need require, it will bee requisite to sew up the lips of the wound, and applie this agglutinative medicine following. ℞. *tereb. venet.* ℥iiii. *gum. elemi,* ℥i. *sang dracon. & mastic an.* ℥ß. *fiat medicamentum ut dictum est:* then the whole yard must bee covered over with a repercussive medicine made of the whites of eggs, with the powder of bole armenick, aloës, *farina volatilis,* and oil of roses. Lastly, it need so require, a wax-candle, or leaden string anointed with Venice turpentine shall bee thrust into the *Uretbra,* to hasten the agglutination, and retain the natural smoothness and straightness of the urinarie passage, least peradventure a caruncle grow therein.

How to hasten the agglutination.

CHAP. XLI.

What manner of section is to bee made when a stone is in a boy's bladder.

Hitherto wee have shewed, by what means it is convenient to draw small stones out of the ureter, bladder and passage of the urine; now will wee briefly shew the manner of takeing of greater stones out of the bladder, which is performed by incision and iron instruments, and I will deliver the practice thereof first in children, then in men, and lastly in women. First therefore let the Surgeon take the boy (upon whom it is determined the work shall bee performed) under the arm-holes, and so give him five or six shakes, that so the stone may descend the more downwards to the neck of the bladder. Then must you caus a strong man, sitting upon an high seat, to lay the childe upon his back with his face from him-ward, haveing his hips lying upon his knees. The childe must lie somwhat high, that hee may breathe the freelier, and let not the nervous parts bee too much stretched, but let all parts bee loos and free for the drawing forth of the stone. Furthermore, it is fit that this strong man, the childe's legs beeing bended back, wish the childe, that puttings his legs to his hams, that hee draw them up as much as hee can, and let the other bee sure hee keep them so; for this site of the childe much conduceth to well performing of the work. Then let the Surgeon thrust two of the fingers of his left hand as far into the childe's fundament as hee is able; but let him with his other hand press the lower bellie, first wrapping a cloth about his hand, that so the compression may bee the less troublesom, and least inflammation should happen rather by this means then by the incision. Now the compression hath this use, to caus the stone to descend out of the bottom of the bladder into the neck thereof under the *os pubis,* whither after it is arrived, it must bee there kept, and as it were governed by the command of your hand, least it should slide from that place whereto you have brought it. These things thus don, nothing now remaineth, but that the Surgeon, with a wound som two fingers breadth distant from the fundament, cut through all the flesh even to the stone on the left side of the *Perinæum.* But in the *interim,* let him beware that hee hurt not the *intestinum rectum*; for it may, and usually doth happen, that whil'st the stone is brought out of the bottom of the bladder to the neck thereof, this gut is doubled in: now, if it bee cut with your incision-knife, it cometh to pass that the excrements may somtimes com out at the wound, and the urine by the fundament, which thing hath in manie hindred the agglutination and consolidation of the wound; yet in som others it hach don little harm, becaus in this tender age manie things happen, which may seem to exceed nature: the incision beeing made, the stone must bee plucked forth with the instrument heer expressed.

Why the boy must bee shaken before cutting.

How to place the childe before dissection.

Where to divide the *perinæum.*

Nature verie powerful in children.

Hooks to pull stones forth of children's bladders.

The stone beeing drawn out, a small pipe shall bee put into the wound, and there kept for som space after, for reasons heerafter to bee delivered; then his knees shall bee bound together, for thus the wound will the sooner close and bee agglutinated. The residue of the cure shall bee performed by reduceing the general cure of wounds, to the particular temper of the childe's age, and the peculiar nature of the childe in cure.

General rules must bee reduced to particular bodies.

CHAP. XLII.

How to cut men, for the takeing out of the stone in the bladder.

SEeing wee cannot otherwise help such men as have stones in their bladders, wee must com to the extreme remedie, to wit, cutting. But the patient must first bee purged, and if the case require, draw som blood; yet must you not immediately after this, or the day following hasten to the work: for the patient cannot but bee weakned by purgeing and bleeding. Also it is expedient for som daies before to foment the privities with such things as relax and soften, that by their yeelding, the stone may the more easily bee extracted. Now the cure is thus to bee performed: The patient shall bee placed upon a firm table or bench with a cloth manie times doubled under his buttocks, and a pillow under his loins and back, so that hee may lie half upright with his thighs lifted up, and his legs and heels drawn back to his buttocks. Then shall his feet bee bound with a ligature of three fingers breadth cast about his ankles, and with the heads thereof beeing drawn upwards to his neck, and cast about it, and so brought downwards, both his hands shall bee bound to his knees, as the following figure sheweth.

What to bee don before dissection.

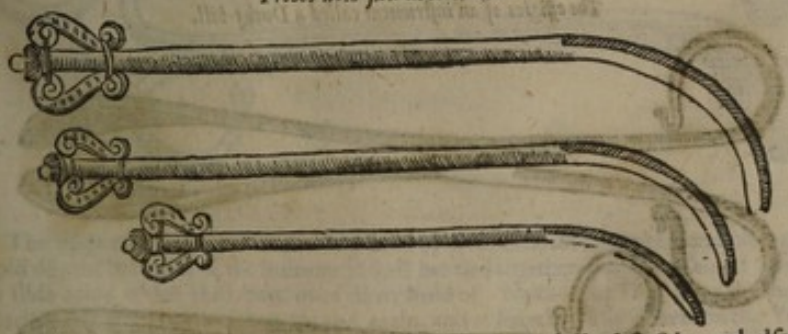
How to lay the patient.

The figure of a man lying readie to bee cut for the stone.

The patient thus bound, it is fit you have four strong men at hand; that is, two to hold his arms, and other two who may so firmly and straightly hold the knee with one hand, and the foot with the other, that hee may neither moov his limbs, nor stir his buttocks, but bee forced to keep in the same posture with his whole bodie. Then the Surgeon shall thrust into the urenarie passage even to the bladder, a silver or iron and hollow *probe*, anointed with oil, and opened or slit on the out-side, that the point of the knife may enter thereinto, and that it may guide the hand of the workman, and keep the knife from pierceing anie farther into the bodies lying there-under. The figure of this *probe* is heer expresst.

Why the *probe* must bee slit on the out-side.

Probes with slits in their ends.



Hee shall gently wrest the *probe*, beeing so thrust in, towards the left side, and also hee who standeth on the patient's right hand, shall with his left hand gently lift up his cods, that so in the free and open space of the left side of the *perinæum*, the Surgeon may have the more libertie to make the incision upon the *probe*, which is thrust in and turned that way. But in making this incision, the Surgeon must bee careful that hee hurt not the seam of the *perinæum* and fundament. For if that seam bee cut, it will not bee easily consolidated, for that it is callous and bloodless, therefore the urine would continually drop forth this way. But if the wound bee made to near the fundament, there is danger, least by forcible plucking forth of the stone hee may break som of the hemorrhoid veins, whence a bleeding may ensue, which is scarce to bee stopped by anie means, or that hee may rend the sphincter-

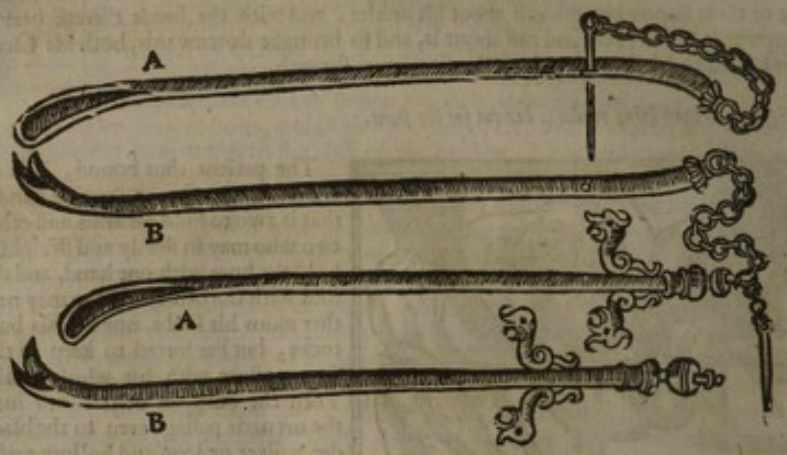
Why the seam of the *perinæum* must not bee cut.

Where to make the wound to take forth the ſtone.

That which is torn is ſooner healed then that which is cut.

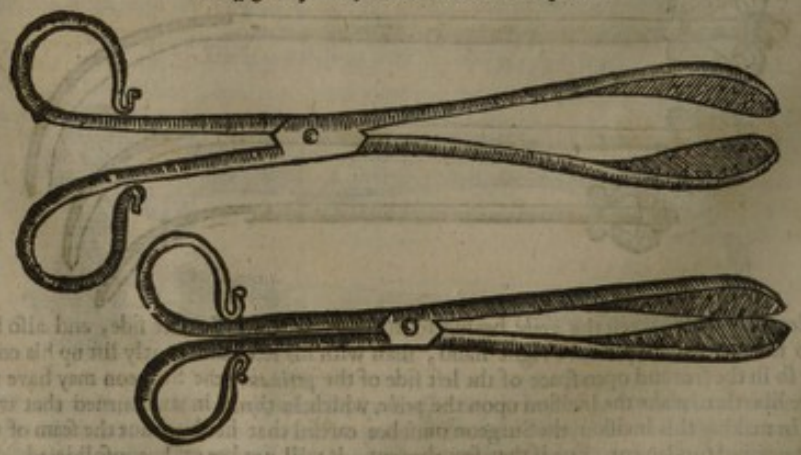
muſcle, or bodie of the bladder, ſo that it can never bee repaired. Therefore it muſt bee made the ſpace of two fingers from the fundament, according to the ſtraightneſs of the fibres, that ſo it may bee the more eaſily reſtored afterwards. Neither muſt the inciſion thus made, exceed the bigneſs of ones thumb, for that it is afterwards enlarged by putting in the Crow's beak and the dilater, but more by the ſtone as it is plucked forth. But that which is cut, is neither ſo ſpeedily nor eaſily healed up, as that which is torn. Then preſently put into the wound ſom one of theſe ſilver inſtruments delineated heer below, and called by the name of *Guiders*, for that they ſerv as guides to the other inſtruments which are to bee put into the bladder; theſe are made with a round and prominent head, whereby it may bee put into the deſcribed cavitie of the *probe*, and they are noted by theſe letters, A.A. then there are others marked with the letters, B.B. and called by the like name, and are to bee put under the former, beeing made forked at the end, that ſo it may, as it were, embrace the end of the former.

The figures of Guiders of two ſorts.



Now the *probe* is to bee drawn forth, and the guiders to bee thruſt and turned up and down in the bladder, and at length to bee ſtaied there by putting in the pin; yet ſuch guiders as want a pin are fitter for the hand, and are by ſom called *ſpathæ*. Then muſt they bee held betwixt the Surgeon's fingers. It will bee alſo neceſſarie for the Surgeon to put another inſtrument called the Duckſ-bill between the two guiders into the capacitie of the bladder; hee muſt thruſt it in ſomwhat violently, and dilate it ſo thruſt in with both his hands, turning it everie way to enlarge the wound as much as ſhall bee ſufficient for the admitting the other inſtruments which are to bee put into the bladder; yet it is far better for the patient, if that the wound may with this one inſtrument bee ſufficiently dilated, and the ſtone pulled forth with the ſame without the help of anie other.

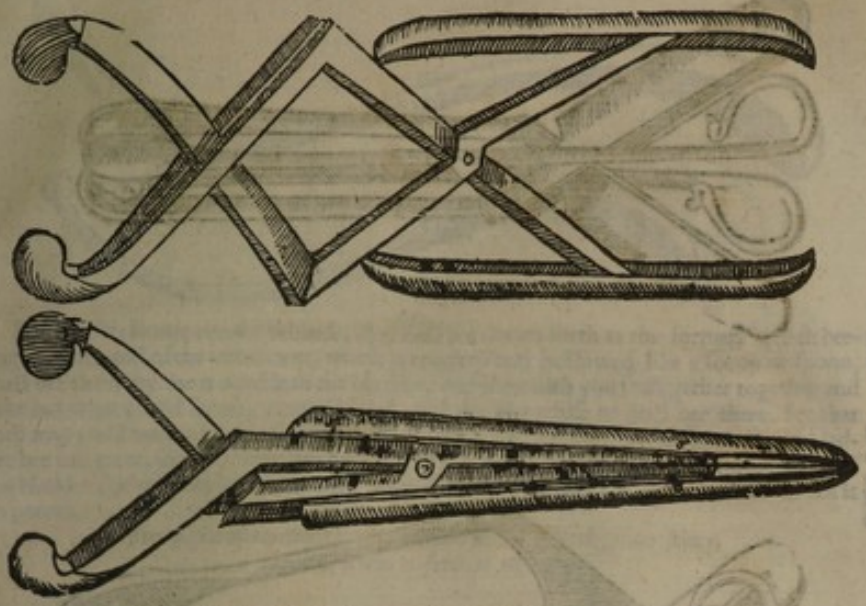
The effigies of an inſtrument called a Ducks-bill.



Which if you have not in a readineſs, and the largeneſs of the ſtone require more dilatation, then muſt you put in this dilater; for beeing put into the bladder, and the handle preſſed together, it will dilate the inciſion as much as you deſire.

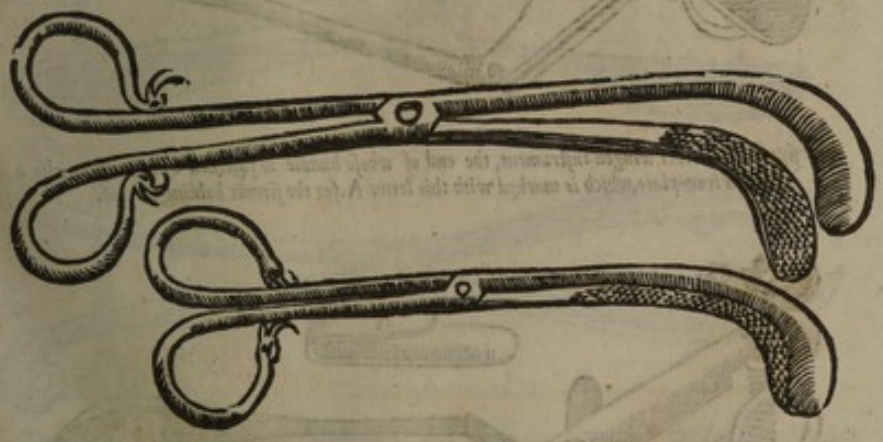
The

The figure of a Dilater ſhut and opened.



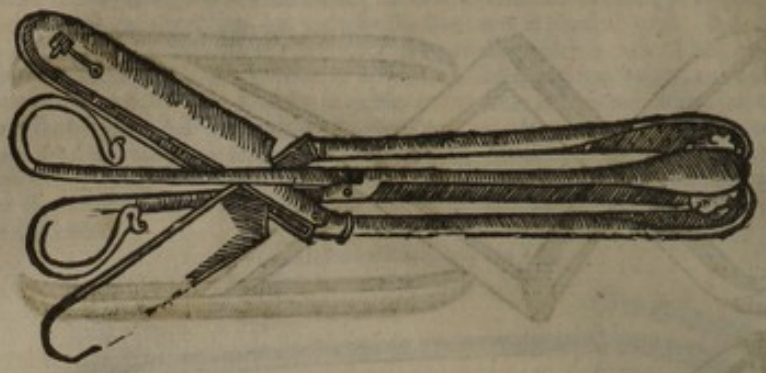
The wound by the help of this inſtrument beeing dilated as much as is ſufficient, then put in the ſtraight Duckſ-bill before deſcribed, or the crooked heer expreſt.

Crooked Forcipes *like a Ducks-bill.*



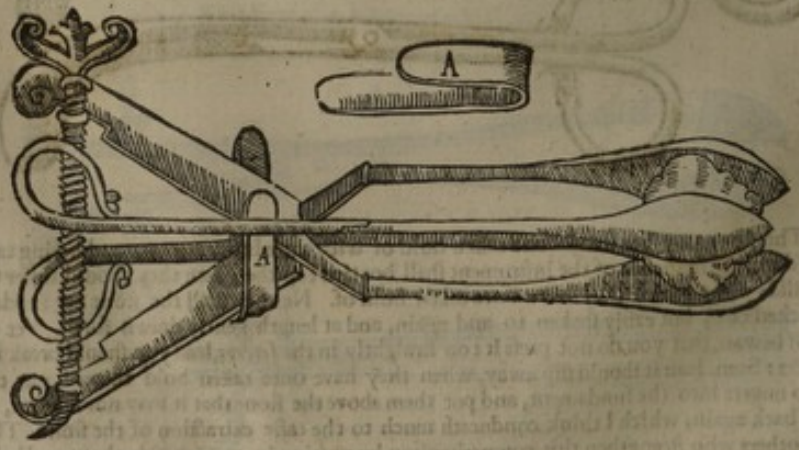
The ſtone may bee ſought and taken hold of with theſe inſtruments, and beeing taken hold on, the branches of the inſtrument ſhall bee tied together, leaſt they ſhould ſuffer that to ſlide away which they have once taken hold of. Neither ſhall the ſtone bee ſuddenly plucked out, but eaſily ſhaken to and again, and at length gently drawn forth. Yet you muſt beware that you do not preſs it too ſtraightly in the *forceps*, leaſt you ſhould break it in pieces: Som, leaſt it ſhould ſlip away, when they have once taken hold thereof, put their two fingers into the fundament, and put them above the ſtone that it may not fall out, nor ſlip back again, which I think conduceth much to the eaſie extraction of the ſtone. There are others who ſtrengthen this comprehenſion by putting in on each-ſide above and below theſe winged inſtruments, ſo that the ſtone can ſlip forth on no ſide.

Winged inſtruments to hold the ſtone with the Duck's-beak.



The figure of another.

The figure of another winged inſtrument, the end of whoſe handle is faſtened by a ſcrue, as alſo a bended iron-plate, which is marked with this letter A. *for the firmer holding thereof.*



A note of more ſtones then one.

After the ſtone is by theſe means drawn forth, obſerv diligently whether it bee worn on anie ſide, and as it were levigated; for that happeneth by the wearing or rubbing of one or more ſtones upon it; yet there is no ſurer way to know this, then by ſearching with a *Catheter*. The one end of the following inſtrument may ſupplie the want of a *Catheter* or probe, and the other may ſerv for a ſcoop or cleanſer.

A cleanſer

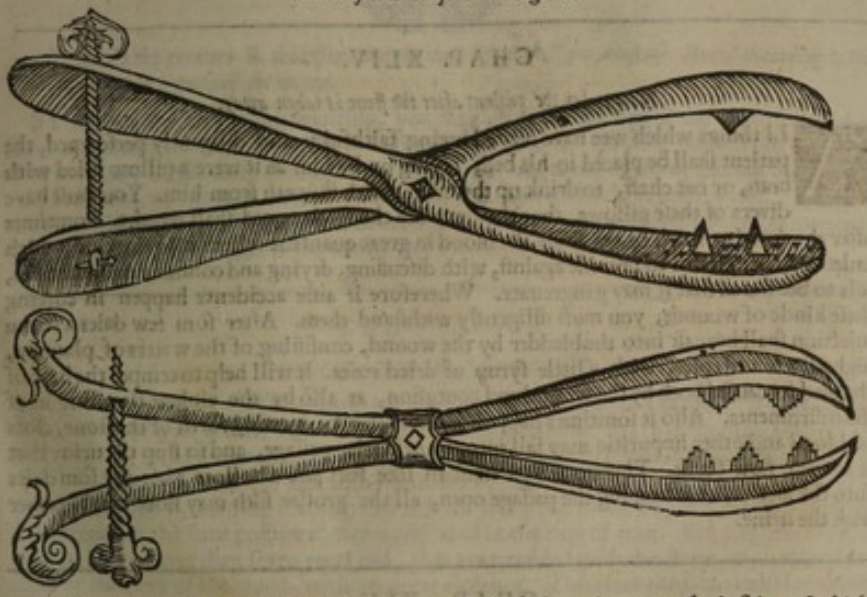
A cleanser or scoop whereby you may search whether there bee anie more stones behinde, as also cleanse or purge the bladder from gravel, clots of blood, and other such bodies, as use to remain behinde after the drawing forth of the stone.

For if other stones remain behinde, they shall bee drawn forth as the former, which beeing don, the end of the instrument, which is crooked and hollowed like a scoop or spoon, shall bee thrust by the wound into the bladder, and therewith you shall gather together and take out what gravel soever, clotted blood, and the like refuse as shall bee there, for that they may yeeld matter for another stone. But if you finde that the stone which is in the bladder bee too great, so that it may not bee plucked forth without great and fearful rending of the bladder, it will bee better to take hold thereof with this Crows bill and so break it to peeces.

How to cleanse the bladder.

How to break a stone that cannot bee taken out whole and at once.

The effigies of a toothed Crow's-bill made neatly to break greater stones, with a screw to force it together.



This Crows-bill hath onely three teeth, and those sharp ones on the inside, of which two are placed above, and one below, which is the middle-most, so that it falleth between the two upper. When the stone is broken, all the peeces thereof must bee taken forth, and wee must have a special care, lest any peece thereof lie hid; for that in time, increased by the access of a tough and viscuous matter, or conjoined with other fragments by the interposition of the like matter as glew, may rise to a stone of a large bigness.

CHAP. XLIII.

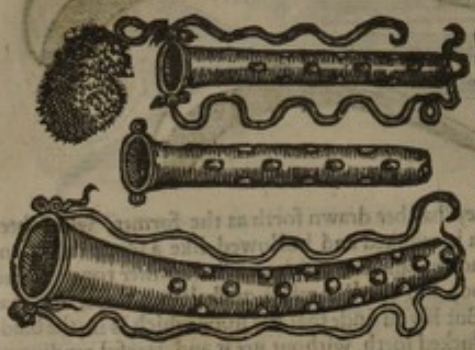
What cure must bee used to the wound, when the stone is taken forth.

THe stone beeing drawn out, if the greatness of the wound so require, it shall have one or two stitches with a needle and threed, leaving onely so much space as shall bee sufficient to put in a pipe for the use wee shall hereafter shew; your threed must bee of crimson silk waxed, and let it not bee too small, least it by bindeing should cut asunder the fleshie lips of the wound, or rot in a short time, either by the moisture of the urine, or matter flowing from the ulcer. Therefore you shall

Of sewing the wound when the stone is taken forth.

ſhall take up much fleſh with the skin in ſewing it, leaſt the lips of the wound beeing torn, your labor proov in vain, and ſo you are forced to trouble the patient with makeing a new one. Things beeing thus performed, a ſilver pipe ſhall bee put through the wound into the bladder, whereof I have here given you divers forms, that you may take your choice, & ſo fit them to the wounds, and not the wounds to them, which oft-times in want of inſtruments the Surgeons are forced to do, to the great harm of the patient.

Silver pipes to bee put into the bladder when the ſtone is drawn out.



Theſe muſt have no holes in their ſides (as thoſe here expreſſed) but onely in their ends, that all the matter of the wound, and the filth gathered and concrete in the bladder may flow and bee carried forth this way. When cleer urine ſhall begin to flow out of the wound, there ſhall bee no more need of a pipe; therefore if you continue it and keep it longer in the wound, there is ſom danger leaſt nature accuſtomed to that way, may afterwards neglect to ſend the water through the *Urethra*, or urinarie paſſage. Neither muſt you forget to defend the parts near to the wound with the following repercuſſive medicine, to hinder the defluxion and inflammation, which are incident by reaſon of the pain. R. *album ovorum nu.* iii. *pul. boli armeni, ſanguinis dracon. an.* ℥iii. *olei roſ.* ℥i. *pilorum leporinorum quantum ſufficit*, make a medicine of the conſiſtence of honey.

A repercuſſive medicine.

CHAP. XLIV.

How to lay the patient after the ſtone is taken away.

ALl things which wee have recited beeing faithfully and diligently performed, the patient ſhall be placed in his bed, laying under him as it were a pillow filled with bran, or oat chaff, to drink up the urine which floweth from him. You muſt have divers of theſe pillows, that they may bee changed as need ſhall require. Somtimes after the drawing forth of the ſtone, the blood in great quantitie falleth into the Cod, which unleſs you bee careful to provide againſt, with diſcuſſing, drying and conſumeing medicines, it is to bee feared that it may gangrenate. Wherefore if anie accidents happen in cureing theſe kinde of wounds, you muſt diligently withſtand them. After ſom few daies a warm injection ſhall bee caſt into the bladder by the wound, conſiſting of the waters of plantain, night-ſhade and roſes, with a little ſyrup of dried roſes. It will help to temper the heat of the bladder cauſed both by the wound and contuſion, as alſo by the violent thruſting in of the inſtruments. Alſo it ſomtimes happen's, that after the drawing forth of the ſtone, clots of blood and other impuritie may fall into the urinarie paſſage, and ſo ſtop the urine that it cannot flow forth. Therefore you muſt in like ſort put a hollow *probe* for ſom daies into the *urethra*, that keeping the paſſage open, all the groſſer filth may flow out together with the urine.

Remedies for the Cod, leaſt it gangrenate.

CHAP. XLV.

How to cure the wound made by the inciſion.

YOu muſt cure this wound after the manner of other bloodie wounds, to wit, by agglutination and cicatrization, the filth, or ſuch things as may hinder, beeing taken away by detergent medicines. The patient ſhall haſten the agglutination if hee lie croſs-legged, & keep a ſlender diet until the ſeventh or ninth day bee paſt. Hee muſt wholly abſtain from wine, unleſs it bee verie weak; in ſtead thereof let him uſe a decoction of barlie and licoriſh, or mead, or water and ſugar, or boiled water mixed with ſyrrups of dried roſes, maidenhair, and the like. Let his meat bee panado, raiſons, ſtewed prunes, chickens boiled with the cold ſeeds, purſlain, ſorrel, borage, ſpinage, and the like. If hee bee bound in his bellie, a Phyſician ſhall bee called, who may help it, by appointing either *Caſſia*, a glyſter, or ſom other kinde of medicine as hee ſhall think good.

What things haſten the union.

CHAP.

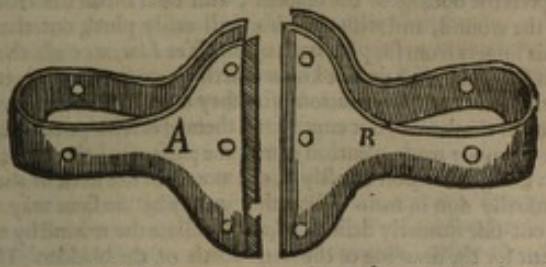
CHAP. XLVI.

What cure is to bee used to Ulcers, when as the urine flow's through them, long after the stone is drawn out.

MAnie, after the stone is drawn out, cannot have the ulcer consolidated, therefore the urine flow's out this way continually by little & little, and against the patient's will dureing the rest of his life, unless the Surgeon help it. Therefore the callous lips of the wound must bee amputated, so to make a green wound of an old ulcer; then must they bee tied up, & bound with the instrument wee term a *Retinaculum* or stay; this must bee perforated with three holes, answering to three other on the other side; needles shall bee thrust through these holes, takeing hold of much flesh, and shall bee knit about it, then glutinative medicines shall bee applied, such as are Venice Turpentine, gum *Elemi*, *sanguis draconis*, bole armenick and the like; after five or six daies the needles shall bee taken out, and also the stay taken away. For then you shall finde the wound almost glewed, and there will nothing remain but onely to cicatrize it.

How to make a fresh wound of an old ulcer.

The figure of a Retinaculum, *or stay.*



A. *shew's the greater.* B. *the lesser, that you may know that you must use divers according to the different bigness of the wound.*

If a *Retinaculum* or stay bee wanting, you may conjoin the lips of the wound after this following manner. Put two quills somwhat longer then the wound, on each side one, and then presently thrust them through with needles haveing thred in them, takeing hold of the flesh between, as often as need shall require, then tying the thred upon them. For thus the wound shall bee agglutinated, and the fleshie lips of the wound kept from beeing torn, which would bee in danger if the needle and thred were onely used.

What to do in want of a stay.

CHAP. XLVII.

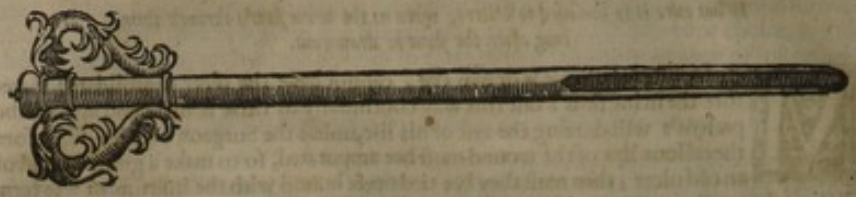
How to take stones out of women's bladders.

WEe know by the same signs that the stone is in a woman's bladder as wee do in a man's, yet it is far more easily searched by a *Catheter*, for that the neck of the bladder is the shorter, broader and the more streight. Wherefore it may not onely bee found by a *Catheter* put into the bladder, but also by the fingers thrust into the neck of the womb, turning them up towards the inner side of the *Os pubis*, and placeing the sick woman in the same posture as wee mentioned in the cure of men. Yet you must observ that maids younger then seven yeers old, that are troubled with the stone, cannot bee searched by the neck of the womb, without great violence. Therefore the stone must bee drawn from them by the same means as from boies, to wit. by thrusting the fingers into the fundament; for thus the stone beeing found out, and the lower bellie also pressed with the other hand, it must bee brought to the neck of the bladder, and then drawn forth by the forementioned means. Yet if the riper yeers of the patient permit it to bee don without violence, the whole work shall bee more easily and happily performed, by putting the fingers into the neck of the womb, for that the bladder is nearer the neck of the womb, then it is to the right gut. Wherefore the fingers thus thrust in, a *Catheter* shall bee presently put into the neck of the bladder: This *Catheter* must bee hollow, or slit on the outside like those before described but not crooked, but straight, as you may perceiv by the following figure.

How to search for the stone in women.

A Cathe-

A Catheter, *upon which, beeing put into the bladder, the neck thereof may bee cut, to draw out a ſtone from a woman.*



Upon this inſtrument the neck of the bladder may bee cut, and then with the *Dilater* made for the ſame purpoſe, the inciſion ſhall bee dilated as much as need require's; yet with this caution, that ſeeing the neck of a womans bladder is the ſhorter, it admit's not ſo great dilatation as a mans, for otherwiſe there is danger that it may com to the bodie of the bladder, whence an involuntarie ſhedding of the water may enſue and continue thereafter. The inciſion beeing dilated, the Surgeon putting one or two of his fingers into the neck of the womb, ſhall preſs the bottom of the bladder, and then thruſt his crooked inſtruments or *forcipes* in by the wound, and with theſe hee ſhall eaſily pluck out the ſtone, which hee ſhall keep with his fingers from ſlipping back again. Yet *Laurence Collo* the King's Surgeon, and both his ſons (then whom I do not know whether ever there were better cutters for the ſtone) do otherwiſe perform this operation; for they do not thruſt their fingers into the fundament or neck of the womb, but contenting themſelvs with putting in onely the guiders (whereof wee formerly made mention) into the paſſage of the urine, they preſently thereupon make a ſtraight inciſion directly at the mouth of the neck of the bladder, and not on the ſide, as is uſually don in men. Then they gently by the ſame way thruſt the *forcipes* hollowed on the out-ſide formerly delineated, and ſo dilate the wound by tearing it as much as ſhall bee ſufficient for the drawing of the ſtone forth of the bladder. The reſidue of the cure is the ſame with that formerly mentioned in men: yet this is to bee added, that if an ulcer grow in the neck of the bladder by reaſon of the rending it, you may by putting in the *ſpeculum matricis*, dilate the neck of the womb, that fitting remedies may bee applied with the more eaſ.

CHAP. XLVIII.

Of the ſuppreſſion of the Urine by internal cauſes.

In ſuppreſſion of the urine wee muſt not preſently flie to diureticks.

BEſides the fore-mentioned cauſes of ſuppreſſed urine, or difficultie of making of water, there are manie other, leaſt anie may think that the urine is ſtop't onely by the ſtone or gravel, as Surgeons think, who in this caſe preſently uſe diureticks. Therefore the urine is ſuppreſt by external and internal cauſes. The internal cauſes are clotted blood, tough phlegm, warts, caruncles bred in the paſſages of the urine, ſtones, and gravel; the urine is ſomtimes ſuppreſt, becauſ the matter thereof, to wit, the ſerous or whayiſh part of the blood, is either conſumed by the feveriſh heat, or carried other waies by ſweats or a ſcouring; ſomtimes alſo the flatulencie there contained, or inflammation ariſing in the parts made for the urine and the neighboring members, ſuppreſſe's the urine. For the right gut, if it bee inflamed, intercept's the paſſage of the urine, either by a tumor whereby it preſſeth upon the bladder, or by the communication of the inflammation. Thus by the default of an ill-affected liver, the urine is oft-times ſuppreſt in ſuch as have the dropſie; or elſ by dulneſs or decay of the attractive, or ſeparative facultie of the reins by ſom great diſtemper, or by the default of the animal-facultie, as in ſuch as are in a phrenſie, lethargie, convulſion, apoplexie. Beſides alſo a tough and viſcid humor falling from the whole bodie into the paſſages of the urine, obſtruct's and ſhut's up the paſſage. Alſo too long holding the water ſomtimes cauſe's this affect. For when the bladder is diſtended above meaſure, the paſſage thereof is drawn together, and made more ſtraight: heerto may bee added, that the too great diſtenſion of the bladder is a hinderance that it cannot uſe the expulſive facultie, and ſtraiten it ſelf about the urine to the excluſion thereof; heerto alſo pain ſucceed's, which preſently deject's all the faculties of the part which it ſeizeth upon. Thus of late a certain young man, riding on horſ-back before his miſtreſs, and therefore not dareing to make water, when hée had great need ſo to do, had his urine ſo ſuppreſt, that returning from his journie home into the citie, hee could by nò means poſſible make water. In the mean time hee had grievous pain in the bottom of his bellie and the *perinæum*, with gripeings, and a ſweat all over his bodie, ſo that hee almoſt ſwooned. I beeing called, when I had procured him to make water by putting in an hollow *Catheter*, and preſſing the bottom of his bellie, whereof hee forthwith made two pintes; I told them that it was not occaſioned by the ſtone, which notwithſtanding the ſtanders by imagined to bee the occaſion of that ſuppreſſion of urine.

Why the too long holding the urine cauſeth the ſuppreſſion thereof.

An hiſtorie.

urine. For thence forward there appeared no signs of the stone in the youth, neither was hee afterwards troubled with the stopping of his urine.

CHAP. XLIX.

A digression concerning the purgeing of such things as are unprofitable in the whole bodie by the the urine.

I Think it not amiss to testifie by the following histories, the providence of nature in expelling by urine such thing as are unprofitable in the whole bodie. *Mounsieur Sarret* the King's secretarie was wounded in the right arm with a pistol-bullet; manie and malign symptoms happened thereupon, but principally great inflammations, flowing with much *sanies* and *pus* or quitture: it somtimes happened that without anie reason this purulent and sanious efflux of matter was staied in inflammation; whereof while wee sollicitously inquired the caus, wee found both his stools and water commixed with much purulent filth, and this through the whole cours of the diseas, whereof notwithstanding by God's assistance hee recovered, and remain's whole and sound; wee observed that as long as his arm flowed with this filthie matter, so long were his excrements of the bellie and bladder free from the sanious and purulent matter: as long on the contrarie as the ulcers of the arm were drie, so long were excrements of the guts and bladder sanious and purulent. The same accident befel a Gentleman called *Mounsieur de la Croix*, who received a deadlie wound with a sword on the left arm, though *German Chaval* and *Master Ras* most expert Surgeons, and others, who together with mee had him in cure, thought it was not so for this reason, becaus the *pus* cannot run so long a way in the bodie, neither if it it were so, could that bee don without the infection and corruption of the whole mass of blood, whil'st it flow's through the veins; therefore to bee more probable that this quantitie of filth, mixed with excrements & urine, flowed out by the default of the liver, or of som other bowel, rather then from the wounded arm: I was of a contrarie opinion for these following reasons. First for that which was apparently seen in the patient; for as long as the excrement and urine were free from this purulent matter, so long his arm plentifully flowed therewith; this on the contrarie beeing drie, much purulent was voided both by stool and urine. Another was, that as our whole bodie is perspirable, so it is also (if I may so term it) confluxible. The third was an example taken from the glasses which the French term *Monte-vins* (that is, Mount-wines) for if a glas that is full of wine bee set under another that is fill'd with water, you may see the wine rais it self out of the lower vessel to the upper through the mid'st of the water, and so the water descend through the mid'st of the wine, yet so, that they do not mix themselvs, but the one take and possess the place of the other. If this may bee don by art, by things onely natural, and to bee discerned by our eies, what may bee don in our bodies, in which by reason of the presence of a more noble soul, all the works of nature are far more perfect? What is it which wee may despair to bee done in the like case? For doth not the laudable blood flow to the guts, kidnies, spleen, bladder of the gall, by the impuls of nature together with the excrements, which presently the parts themselvs separate from their nutriment? Doth not milk from the breasts flow somtimes forth of the wombs of women lately delivered? Yet that cannot bee carried down thither, unless by the passages of the mammillarie veins and arteriers, which meet with the mouths of the vessels of the womb in the middle of the straight muscles of the *Epigastium*. Therefore no marvel if according to *Galen* the *pus* unmix't with the blood flowing from the whole bodie by the veins and arteries into the kidnies and bladder, bee cast forth together with the urine. These and the like things are don by nature, not taught by anie counsel or reason, but onely assisted by the strength of the segregateing and expulsive faculties; and certainly wee presently dissecting the dead bodie, observed that it all, as also all the bowels thereof, were free from inflammation and ulceration, neither was there anie sign of impression of anie purulent matter in anie part thereof.

An historie.

An historie.

How the *pus* may flow from the wounded arm by the urine and excrements.

Lib. de loc. affic. 6. cap. 4.

CHAP. L.

By what external causes the urine is suppresst; and prognosticks concerning the suppression thereof.

THere are also manie external causes, through whose occasion the urine may bee suppresst. Such are batheing and swimming in cold water; the too long continued application of Narcotick medicines upon the reins, *perinæum* and share; the use of cold meats and drinks, and such other like. Moreover, the dislocation of som *Vertebra* of the loins to the inside, for that it presseth the nerv disseminated thence into the bladder; therefore it causeth a stupiditie or numnes of the bladder. Whence it is, that it cannot perceiv it self to bee vellicated by the acrimonie of the urine, and consequently it is not stirred up to the expulsion thereof. But from whatsoever

Why the dislocation of a *vertebra* of the loins may caus a suppression of urine.

Why the ſuppreſſion of the urine becom's deadly.

ſoever cauſ the oppreſſion of the urine proceed's, if it perſevere for ſom daies, death is to bee feared, unleſs either a fever which may conſume the matter of the urine, or a ſcouring or flux, which may divert it, ſhall happen thereupon. For thus by ſtay it acquireth an acrid and venenate qualitie, which flowing by the veins readily infecteth the maſs of blood, and carried to the brain, much moleſt's it by reaſon of that ſimilitude and ſympathie of condition which the bladder hath with the *Meninges*. But nature, if prevalent, eaſily free'th it ſelf from this danger by a manifeſt evacuation by ſtool, otherwiſe it muſt neceſſarily call as it were to its aid, a feveriſh heat, which may ſend the abounding matter of this ſerous humiditie out through the skin, either by a ſenſible evacuation as by ſweat; becauſ ſweat and urine have one common matter: or elſ diſperſ and breath it out by tranſpiration, which is an inſenſible excretion.

A fever following thereon help's the ſuppreſſion of urine.

CHAP. LI.

Of bloodie Urine.

The differences.

Causes.

SOm piſs pure blood, others mix't, and that either with urine, and then that which is expelled reſemble's the waſhing of fleſh newly killed; or elſ with *pus*, or matter, and that either alone or mixed with the urine: There may bee diverſ cauſes of this ſymptom, as the too great quantitie of blood gathered in the bodie, which by the ſuppreſſion of the accuſtomed and periodical evacuation, by the courſes or hemorrhoids, now turn's its courſ to the reins and bladder: the fretting aſunder of ſom veſſel by an acrid humor, or the breaking thereof by carrying or lifting of ſom heavie burden, by leaping, falling from high, a great blow, the falling of ſom weight upon the loins, rideing Poſt too violently, the too immoderate uſe of venerie, and laſtly, from anie kinde of painful and more violent exerciſe, by a rough and ſharp ſtone in the kidnies, by the weakneſs of the retentive facultie of the kidnies, by a wound of ſom of the parts belonging to the urine, by the too frequent uſe of diuretick and hot meats and medicines, or elſ of things in their whole nature contrarie to the urinarie parts; for by theſe and the like cauſes, the reins are oft-times ſo inflamed, that they neceſſarily impoſtumate, and at length the impoſtume beeing broken it turn's into an ulcer, caſting forth quitture by the urine.

Signs of what cauſes they proceed.

In ſo great varietie of the cauſes of bloodie urine, wee may gather whence the cauſes of this ſymptom may ariſe, by the depraved action of this, or that part, by the condition of the flowing blood, to wit, pure or mix't, and that either with the urine alone, or with *pus*. For example, if this bloodie matter flow from the lungs, liver, kidnies, diſlocated *Vertebræ*, the ſtraight gut, or other the like part: you may diſcern it by the ſeat of the pain and ſymptoms, as a fever: and the proprietie of the pain, and other things which have preceded, or are yet preſent. And wee may gather the ſame by the plentie and qualitie, for if, for example, the *pus* flow from an ulcer of the arm, the purulent matter will flow by turns, one while by the urine, ſo that little is caſt forth by the ulcer; then preſently on the contrarie the urine becom's more cleer. That purulent matter which flow's from the lungs by reaſon of an *Empiema*, or from the liver, or any other bowel placed above the midriff, the *pus* which is caſt forth with the urine, is both in greater plentie and more exactly mixed with the urine, then that which flow's from the kidnies and bladder. It neither belong's to our purpoſe, or a Surgeon's office, either to undertake, or deliver the cure of this affect. It ſhall ſuffice onely to note that the cure of this ſymptom is not to bee hoped for ſo long as the cauſ remain's. And if this blood flow by the opening of a veſſel, it ſhall bee ſtaied by aſtringent medicines; if broken, by agglutinative; if corroded or fretted aſunder, by ſarcotick.

Cure.

CHAP. LII.

Of the ſigns of the ulcerated kidnies.

IHad not determined to follow or particularly handle the cauſes of bloodie urines, yet becauſ that which is occaſioned by the ulcerated reins or bladder more frequently happen's, therefore I have thought good briefly to ſpeak thereof in this place. The ſigns of an ulcer of the reins are, pain in the loins, matter howſoever mix't with the urine, never evacuated by it ſelf, but alwaies flowing forth with the urine, and reſideing in the bottom of the chamber-pot, with a ſanious and red ſediment, fleſhie and as it were bloodie fibres ſwimming up and down in the urine, the ſmell of the filth is not ſo great as that which which flow's from the ulcerated bladder, for that the kidnies, ſeeing thsy are of a fleſhie ſubſtance, do far better ripen and digeſt the purulent matter then the bladder which is nervous and bloodleſs.

Why the matter which flow's from the kidnies is leſs ſtinking then that which flow's from the bladder.

CHAP.

CHAP. LIII.

Of the signs of the ulcerated Bladder.

ULcers are in the bottom of the bladder, and the neck thereof. The signs of an ulcer in the bladder are, a deep pain at the share-bones; the great stench of the matter flowing there-from, white and thin skins swimming up and down in the water. But when the ulcer possesseth the neck of the bladder, the pain is more gentle, neither doth it trouble before the patient com to make water, but in the verie making thereof, and a little while after. Differences.

But it is common both to the one and the other, that the yard is extended in makeing of water, to wit, by reason of the pain caused by the urine fretting of the ulcerated part in the passage by: neither is the matter seen mixed with the urine, as is usual in an ulcer of the upper parts, becaus it is poured forth not together with the urine, but after it.

CHAP. LIV.

Prognosticks of the ulcerated Reins and Bladder.

ULcers of the kidnies are more easily and readily healed then those of the bladder; for fleshie parts more speedily heal and knit, then bloodless and nervous parts. Ulcers which are in the bottom of the bladder, are uncureable, or certainly most difficult to heal; for besides that they are in a bloodless part, they are daily vellicated and exasperated by the continual afflux of the contained urine; for all the urine is never evacuated: now that which remaine's after makeing water, becom's more acrid by the distemper and heat of the part, for that the bladder is alwaies gathered about it, and dilated and straightned according to the quantitie of the contained urine: therefore in the *Ischuria*, that is, the suppression or difficultie of makeing water, you may somtimes see a quart of water made at once. Those which have their legs fall away, haveing an ulcer in their bladder, are near their deaths. Ulcers arising in these parts, unless they bee consolidated in a short time, remain uncureable. Why ulcers of the bladder are cured with more difficultie.

CHAP. LV.

What cure must bee used in the suppression of the Urine.

IN cureing the suppression of the urine, the indication must bee taken from the nature of the disease, and cause thereof, if it bee yet present or not. But the diversitie of the parts, by which beeing hurt, the *Ischuria* happen's, intimate's the varietie of medicines, neither must wee presently run to diureticks, and things breaking the stone, which manie Empericks do. For hence grievous and malign symptoms often arise, especially if this suppression proceed from an acrid humor, or blood pressed out by a bruise, immoderate venerie, and all more vehement exercise, a hot and acrid potion, as of *Cantharides*, by too long abstaining from makeing water, by a *Phlegmon*, or ulcer of the urinarie parts. For thus the pain and inflammation are increased, whence follow's a gangrene, and at length death. Wherefore attempt nothing in this case without the advice of a Physician, no not when you must com to Surgerie. For diureticks can scarce have place in another case, then when the urinarie passages are obstructed by gravel, or a gross and viscid humor, or elsin som cold countrie, or in the application of Narcoticks to the loins, although wee must not heer use these before wee have first made use of general medicines: now diureticks may bee administred sundrie waies, as heerafter shall appear. Scopes of cureing. To what suppression of the urine diureticks must not bee used. To which, and when to bee used.

℞. *agrimon. urtic. parietar. furculos rubros habentis, an.* m.i. *rad. asparag. mundat.* ℥iiii. *gran. alkekengi, nu. xx. sem. malvæ* ℥ß. *rad. acor.* ℥i. *bulliant omnia simul in sex libris aquæ dulcis ad tertias, deinde coletur.* Let the patient take ℥iiii. hereof with ℥i. of sugar candie, and drink it warm fasting in a morning, three hours before meat. Thirtie or fortie Ivie-berries beaten in white wine, and given the patient to drink som two hours before meat, are good for the same purpose. Also ℥i. of nettle-seeds made into fine powder, and drunk in chicken-broth, is good for the same purpose. A decoction also of grummel, Goat's-saxifrage, pellitorie of the wall, white saxifrage, the roots of parslie, *asparagus, acorus, bruscus*, and orris drunk in the quantitie of som three or four ounces, is profitable also for the same purpose. Yet this following water is commended above the rest to provoke urine, and open the passages thereof, from what cause soever the stopping thereof proceed. ℞. *radic. ofmund. regal. cyp. bismal. gram. petrosel. fœnic. an.* ℥ii. *raph. crassior. in taleol.* ℥iiii. *macerentur per noctem in aceto albo acerrimo, bulliant postea in aquæ fluvialis* ℔x. *saxifrag. crist. marin. rub. tinct. milii solis, summitat. malvæ, bismal.* A diuretick water.

piſmal.an. p.ii. *berul.cicer. rub.an.* p.i. *ſem. melon. citrul.an.* ℥ii.ß. *alkekengi, gra.*xx. *glycyrhiz.* ℥.i. *bulliant omnia ſimul ad tertias: in colaturâ infunde per noctem fol. ſen.oriental.*lb.ß. *fiat iterum parva ebullitio, in expreſſione colatâ infunde cinam. elect.* ℥vi.*colentur; iterum colatura injiciatur in alembicum vitreum, poſtea tereb.venet.lucid.*lb.ii. *aq.vitæ* ℥vi. *agitentur omnia ſimul diligentiſſimè. Lutetur alembicum luto ſapientiæ, fiat diſtillatio lento igne in balneo mariæ.* Uſe it after the following manner: R. *aq. ſtillatitiæ preſciptæ* ℥ii. *aut* iii. According to the operation which it ſhall perform, let the patient take it four hours before meat. Alſo radiſh-water diſtilled in *balneo mariæ* is given in the quantitie of ℥iiii. with ſugar, and that with good ſucceſs. Baths and *ſemicupia*, or half baths are artificially made, relax, ſoften, dilate, and open all the bodie; therefore the preſcribed diureticks mixed with half a dram of treacle may bee fitly given at the going forth of the bath. Theſe medicines following are judged fit to cleanſ the ulcers of the kidnies and bladder. Syrup of maiden-hair, of roſes, taken in the quantitie of ℥i. with *hydromel*, or barlie-water: Aſſe's or Goat's-milk are alſo much commended in this affect, becauſ they cleanſ the ulcers by their ſerous or whayiſh portion, and agglutinate by their cheeſ-like. They muſt bee taken warm from the dug, with honie of roſes, or a little ſalt, leaſt they corrupt in the ſtomach; and that to the quantitie of four ounces, drinking or eating nothing preſently upon it. The following Trochiſces are alſo good for the ſame purpoſe. R. *quatuor ſem.frigid.major. ſeminis papaveris albi, portul.ss, plantag.cydon,myrtil, gum. tragacanth. & arab.pinear. glycyrrhi.mund.bordei mund.macag.pſilii, amygdal.dulcium, an.*℥.i. *boli armen. ſanguin.dracon.ſpodii, roſar. malſticb.terræ, ſigil myrrhæ, an.*℥ii. *cum oxymelite, conficiantur ſecundùm artem trochiſci.* Let the patient take 3ß. diſſolved in whay, ptiſan, barlie-water, and the like; they may alſo bee profitably diſſolved in plantain-water, and injected into the bladder. Let the patient abſtain from wine, and inſtead thereof let him uſe barlie-water, or *hydromel*, or a ptiſan made of an ounce of raiſins of the Sun, ſtoned and boiled in five pintes of fair water, in an earthen pipkin well leaded, or in a glaſs, until one pinte bee conſumed, adding thereto of liquorice ſcraped and beaten ℥i. of the cold ſeeds likewiſe beaten two drams. Let it, after it hath boiled a little more, bee ſtrained through an hypocras bag, with a quartern of ſugar, and two drams of choice cinnamon added thereto, and ſo let it bee kept for uſual drink.

Why the uſe of diureticks is better after bathing.

To cleanſ the ulcers of the kidnies and bladder.

Trochiſces to heal the ulcers of the kidnies.

Drink inſtead of wine.

CHAP. LVI.

Of the Diabete, *or inabilitie to hold the Urine.*

What *Diabete* is.

The cauſes.

THe *Diabete* is a diſeaſ, wherein preſently after one hath drunk, the urine is preſently made in great plentie, by the diſſolution of the retentive facultie of the reins, and the depravation of immoderation of the attractive facultie. The external cauſes are the unſeaſonable and immoderate uſe of hot and diuretick things, and all more violent and vehement exerciſes. The internal cauſes are the inflammation of the liver, lungs, ſpleen, but eſpecially of the kidnies and bladder. This affect muſt bee diligently diſtinguiſhed from the excretion of the morbifick cauſes by urine.

Signs.

The loins in this diſeaſ are moleſted with a pricking and biteing pain, and there is a continual and unquenchable thirſt: and although this diſeaſ proceed from a hot diſtemper, yet the urine is not colored, red, troubled, or thick, but thin, and white or wateriſh, by reaſon the matter thereof make's verie ſmall ſtay in the ſtomach, liver, and hollow vein, beeing preſently drawn away by the heat of the kidnies or bladder. If the affect long endure, the patient for want of nouriſhment falleth away, whence certain death enſue's. For the cure of ſo great a diſeaſ, the matter muſt bee purged, which cauſe's or feed's the inflammation or *phlegmon*, and conſequently blood muſt bee let. Wee muſt abſtain from four cold ſeeds, for although they may profit by their firſt qualitie, yet will they hurt by their diuretick facultie. Refrigerateing and aſtringent nouriſhments muſt bee uſed, and ſuch as generate groſs humors; as rice, thick and aſtringent wine mixed with much water. Exceeding cold, yea narcotick things ſhall bee applied to the loins, for otherwiſe by reaſon of the thickneſs of the muſcles of thoſe parts, the force, unleſs of exceeding refrigerateing things, will not bee able to arrive at the reins; of this kinde are oil of white poppie, henbane, *opium*, purſlain, and lettuce-ſeed, mandrage, vineger, and the like: of which, cataplaſms, plaſters, and ointments, may bee made fit to corroborate the parts, and correct and heat.

Why the urines are wateriſh.

The cure.

Narcotick things to bee applied to the loins.

CHAP. LVII.

Of the Strangurie.

What the Strangurie is.

The cauſes.

THe Strangurie is an affect haveing ſom affinitie with the *Diabete*, as that wherein the water is involuntarily made, but not together at once, but by drops, continually and with pain. The external cauſes of a ſtrangurie are, the too abundant drinking of cold water,

water, and all too long stay in a cold place. The internal causes are, the defluxion of cold humors into the urinarie parts; for hence they are resolved by a certain palsie, and the *sphincter* of the bladder is relaxed, so that hee cannot hold his water according to his desire: inflammation also and all distemper causeth this affect, and whatsoever in som sort obstruct's the passage of the urine; as clotted blood, thick phlegm, gravel, and the like. And becaus, according to *Galen*'s opinion, all sorts of distemper may caus this disease, diverse medicines shall bee appointed according to the difference of the distemper. Therefore against a cold distemper fomentations shall bee provided of a decoction of mallows, roses, *origanum*, calamint, and the like, and so applied to the privities: then presently after, let them bee anointed with oil of bays, and of *Castoreum*, and the like. Strong and pure wine shall bee prescribed for his drink, and that not onely in this caus, but also when the strangurie happen's by the occasion of obstruction, caussed by a gross and cold humor, if so bee that the bodie bee not plethorick. But if inflammation, together with a *Plethora* or fulness, hath caussed this affect, wee may, according to *Galen*'s advice, heal it by blood-letting. But if obstruction bee in fault, that shall bee taken away by diureticks either hot or cold, according to the condition of the matter obstructing. Wee heer omit to speak of the *Dysuria*, or difficultie of makeing water, becaus the remedies are in general the same with those which are used in the *Ischuria*, or suppression of urine.

Com. ad aphor. 15. sect. 3.

Ad aphor. 48. sect. 7.

CHAP. LVIII.

Of the Colick.

WHensoever the guts beeing obstructed, or otherwise affected, the excrements are hindred from passing forth, and if the fault bee in the small guts, the affect is termed *Volvulus*, *Ileos*, and *Miserere mei*; but if it bee in the greater guts, it is called the Colick, from the part affected, which is the *Colon*, that is, the continuitie of the greater guts; but especially that portion of the greater guts, which is properly and especially named *Colon*, or the Colick-gut. Therefore *Avicen* rightly define's the Colick, A pain of the guts, wherein the excrements are difficultly evacuated by the fundament. *Paulus Ægineta* reduceth all the causes of the Colick, how various soever, to four heads: to wit, to the grosness, or toughness of the humors impact in the coats of the guts: flatulencies hindred from passage forth: the inflammation of the guts: and lastly, the collection of acrid and biteing humors. Now wee will treat of each of these in particular. Almost the same causes produce the grosness of humors, and flatulencies in the guts, to wit, the use of flatulent and phlegmatick, tough and viscid meats, yea also of such as are of good nourishment, if sundrie thereof, and of sundrie kindes bee eaten at the same meal, and in greater quantitie then is fit. For hence cruditie and obstruction, and at length the collection of flatulencies, whereon a tensive pain ensue's. This kinde of Colick is also caused by the use of crude fruits, and too cold drink, drunken especially when anie is too hot by exercise, or anie other way: for thus the stomach and the guts continued thereto, are refrigerated, and the humors and excrements therein contained are congealed, and, as it were, bound up. The Colick which is caused by the inflammation of the kidnies, happen's by the sympathie of the reins pained or troubled with the stone or gravel contained in them or the ureters. Therefore then also pain trouble's the patient at his hips and loins, becaus the nervs, which arising from the *vertebræ* of the loins, are oppressed by the weight of the stones and gravel, about the joint of the hip are disseminated into the muscles of the loins and thigh. Also the ureters are pained (for they seem nothing elss but certain hollow nervs) and also the cremaster muscles, so that the patient's testicles may seem to bee drawn upwards with much violence. Hence great, phlegmatick, and cholerick vomiting, and sweat of the whole bodie, all which do not surceas before that the stone, or gravel shall bee forced down into the bladder. Now vomiting happen's in this affect, for that the ventricle, by reason of its continuitie and neighborhood which it hath with the guts, suffer's by consent or sympathie. For the stomach is of the same kinde or matter as the guts are, so that the guts seem nothing elss but a certain production of the stomach. Therefore if at anie time nature endeavor to expel anie thing that is troublesom in the kidnies, ureters, coats of the guts, mesenterie, *pancreas*, and hypochondries, it causeth a Colick with pain and vomiting. An hot and drie distemper also causeth the Colick, produceing a pricking and biteing pain, by drying the excrements shut up in the guts, as also by wasting as it were the radical humors of that place provided for the lubricateing of the guts. Acrid, viscid, and tough phlegm causeth the same. There is also another caus of the Colick which is not so common, to wit, the twineing of the guts, that is, when they are so twined, folded, and doubled, that the excrements, as it were, bound in their knots, cannot bee expelled, as it manifestly happen's in the rupture called *Enterocele*, by the falling of the guts into the cod. Likewise also worms generated in the Colick-gut, whil'st that they mutually fold or twine themselvs

What *Ileos*, or *iliaca passio* is.

What *Colica passio*, or the Colick is.

Lib. 3.

Lib. 3. c. 43.

The manner of the stone-colick.

How a hot distemper causeth the colick.

The folding of the guts the caus of the colick.

themſelvs up, do alſo twine the *Colon* it ſelf, and fold it with them. Alſo the too long ſtay of the excrements in the guts, whether it ſhall happen by the peculiar default of the too hot and drie bodie of the patient, or by his diet, that is, the uſe of too drie meats, or exerciſes and pains taken in the heat of the ſun, or by the greatneſs of buſineſs, the minde beeing carried away, cauſeth the colick, with head-ach, and plentie of vapors flying upwards.

An hiſteric. I remember I once diſſected the bodie of a boy of ſom twelv years old, who had his guts folded with manie as it were ties or knots of the reſtrained, too hard and drie excrements, the which hee caſt out by his mouth a little before his death, which brought him to his end, beeing not helped in time by fitting medicines. Now theſe are the cauſes of the colick, according to the opinion of the ancient and modern Phyſicians, of whoſe ſigns I judg it not

Signs whereby wee know that the colick proceed's from this or that cauſ. amiſs heer to treat in particular. You ſhall know the patient is troubled with the ſtone-colick, by the pain which is fixed, and as it were kept in one place, to wit, of the kidnies; by his former manner of life, as if the patient hath formerly voided ſtones or gravel together with his urine; by the pain of the hips and teſticles for the formerly mentioned cauſes, and laſtly, by that the patient caſt's forth by ſtone or urine, for that the great and laborious endevor of nature to caſt forth the ſtone which is in the kidnies, is propagated by a certain ſympathie, and like ſtudie of the neighboring parts, ſtirring up the expulſive faculties each to his work. The ſigns of a flatulent colick are, a tenſive pain, ſuch as if the guts were rent or torn in pieces, together with a noiſe or rumbling in the bellie. The force of the ſhut-up winde is ſomtimes ſo great, that it rendeth or teareth the guts in ſunder, no otherwiſe then a ſwine's bladder too hard blown up. Which when it happen's, the patient die's with much vomiting, becauſ the ſtomack oppreſt with winde, can contain nor imbrace no meat. The colick whith is occaſioned by the too long keeping in of the excrements, is accompanied with the weight and pain of the bellie, the tenſion of the guts, head-ach, apparent hardneſs of the bellie, and the complaint of the patient that hee hath not gon to ſtool in a long time. That which proceed's from a cholerick inflammation, yeeld's a ſenſ of great heat and pulſation in the midſt of the bellie, by reaſon of the veins and arteries which are in the *pancreas* and coats of the guts, and there are the other ſigns of a *Phlegmon*, although alſo this as it were inflammation may ariſe alſo from ſalt, acrid and viſcous phlegm, which nature can neither expel upwards by vomit, nor downwards by ſtool; this ſundrie times is aſſociated with a difficultie of makeing water, for that when as the right gut is inflamed, the bladder is preſſed by reaſon of their ſocietie or neighborhood. The collick which proceed's from the contorſion of the guts, ſhew's it ſelf by the exceſſive crueltie of the pain ariſing, for that the guts are not in their due ſite and place, and becauſ the excrements by their too long detenſion acquire a preternatural heat; and this is the cauſ of the death of manie ſuch as have ruptures, for that the gut falling down from the natural place into the cod, beeing a preternatural place, is redoubled, and kept there as it were bound, whereby the excrements beeing baked, becoming more acridly hot, cauſ inflammation, and by raiſing up flatulencies, increaſ the diſtenſion through all the guts, until at length a deadly *Ileos* or colick ariſing, they com forth at the mouth. For prognoſticks; it is better to have the pain in the colick to wander up and down, then to bee fixed: it is good alſo that the excrements are not wholly ſuppreſt. But the evil ſigns that are heer pronounce the affect either difficult or deadly. Now theſe ſhew that it is deadlie, intolerable tormenting pain, continual vomiting, cold ſweat, coldneſs of the extreme parts, hicketing by reaſon of the ſympathie the ſtomack hath with the guts, a phrenſie by the conſent of the brain with the ſtomach, and oft-times a convulſion, by drawing the matter into the nervs. But ſuch as have gripeing and pain about their navil and loins, which can neither bee helped by medicine nor otherwiſe, it end's in a dropſie. The cure muſt bee diverſified according to the varietie of the cauſes, for the ſtone-collick is cured by medicines proper to the ſtone; that which is cauſed by an *Enterocele*, is cured by the onely reſtoreing the gut to its place; that which is occaſioned by worms, require's medicines fit to kill and caſt forth the worms. But that which proceed's from the weakneſs and refrigeration of the guts and ſtomack, is cured by heating and ſtrengthening medicines as well applied outwardly, as taken in inwardly by the mouth, or otherwaies. The beginning of the cure of that which is occaſioned by tough phlegm and flatulencies, is by the mitigation of the pain, ſeeing there is nothing which more deject's the powers then pain. To this purpoſe ſhall you provide baths, *Semicupia*, fomentations of mallows, marſh-mallows, violet leavs, penie-royal, fennel, *Origanum*, the ſeeds of time and fenugreek, flowers of camomil, melilote, and other ſuch like, which have power to heat, drie, attenuate, and rariſie the skin, ſo to diſſipate the winde. But all ſuch muſt bee actually hot. Alſo the bellie may bee anointed with this following ointment. R. *olei chamom. anetb. butyr. recent. an.* ℥i. *ſem. apii, petroſ. & galang. an.* ℥ß. *aq. vitæ, ol. ſalviæ aut thymi chimicè extracti q. ſ.* The following liniment is much commended by *Hollerius*. R. *olei ruti & nardi, an.* ℥vi. *galbani cum aq. vit. diſſoluti* ℥ii. *liquefactis ſimul adde zibetæ gr.* iiii. *croci gr.* vi. *fiat linimentum.* Alſo little bags made with millet, oats and ſalt fried with a little white wine in a frying-pan, ſhall bee applied hot upon the bellie and flanks, and renewed before they grow cold. You may, in ſtead of theſe bags, uſe ox-bladders half filled with a decoction of reſolving things;

Aviceu. li. 3. Hip. apbor. 10. ſect. 4.

The cure.

Baths and anodine fomentations.

An ointment.

things; as salt, rosemarie, time, lavander, bay-berries, and the like: then inject a glyster being thus made. R. *quatuor remol. an* m.i. *orig. puleg. calamenth. an* m.ß. *anisi, carui an.* ti.ß. *flor. aneth. an.* p.i. *bulliant in hydromele ad* ℔.i. *in quâ dissolve bened. laxat. mellis anthosati, sacc rub. an.* ℥i. *olei aneth. & chamæm. an.* ℥iß. Let a glyster bee made to bee injected at twice; for the guts being stretched out cannot contain the accustomed *dosis* of a glyster: Also this following glyster is much approoved. R. *vini malvat. & olei nucum, an.* ℥iii. *aquæ vitæ,* ℥i. *olei juniperi, & rut. per quintam essent extract. an.* ℥iii. Let this bee injected as hot as the patient can endure. I have oft-times as by miracle helped intolerable pain caused by the winde-collick and phlegm with this glyster. *Avicen* prescribe's a carminative glyster made of hyssop, *origanum, acorus*, anis-seeds, and English galengal. Let the patient feed upon meats of good juice and easie digestion, as broths made with the yolks of eggs, saffron, hot herbs and a nutmeg; let him drink good wine, as Muskadine, or hypocras made with good wine so to heat the stomach and guts. For in *Galen's* opinion, all windines is generated by a remiss heat. But if the pain shall continue, a large cupping-glass shall bee applied to the navel, to draw and dissipate the windines; the bellie shall bee bound with strong and broad ligatures, to strengthen the guts, and discuss the matter of flatulencies. The patients taught by nature, use this remedie, whil'st none admonishing them, they press the bellie with their hands in the bitternes of pain. But if the pain cannot bee thus appeased, wee must com to such medicines as work by an occult propertie, as the dried gut of a Wolf, for a dram thereof made into powder it given in wine with good succes. That colick which is caused by a cholerick inflammation require's contrarie medicines, to wit, blood-letting, and a refrigerateing diet; potions made of *Diatatbolicon* and *Cassia* dissolved in barlie-water, also cooling glysters. *Avicen* prescribe's narcoticks, for that beeing cold, they are contrarie to the morbifick caus which is hot and drie; such are pills of *Philonium.* Also pills of *Hyera picra* in the quantitie of ℈iv. with *opion* and saffron, of each one grain, may bee used. Also baths are appointed, made of water wherein mallows, marsh-mallows, violet-leavs, flowers of white lilies, lettuce, purslain have been boiled, to correct the acrimonie of the cholerick and hot humors, whence the disease and symptom ariseth. That colick which is like to this, and proceed's from salt, acrid, thick and tough phlegm, is cured, the humor beeing first attenuated and diffused, and at length evacuated by medicines taken by the mouth and otherwise, according to the prescription of the learned Physician. But *Avicen* cure's that which is occasioned by the suppression of the hardened excrements, and twineing of them by meats which have an emollient facultie, such as humecting broths, as that which is made of an old cock tired with running, and threshed to death, and so boiled with dill, polypodie, and a little salt, until the flesh fall from the bones; also hee useth detergent glysters, such as this which follow's. R. *betæ,* m.i. *furfuris,* p.i. *ficus,* nu.x. *alth.* m.i. *fiat decoctio ad* ℔.i. *in quâ dissolve nitri & muriæ an.* ℥ii. *sacc.* ℥i. *ol. sesamini,* ℥ii. But if the obstruction bee more contumacious, you must use more powerful ones made *ex cyclamin. centaurio, & hiera diacolocinth. ad* ℥ii. But if the obstruction do notwithstanding remain, so that the excrements com forth at the mouth, *Marianus Sanctus* wisheth (by the counsel of manie who have so free'd themselvs from this deadlie symptom) to drink three pounds of quick-silver with water onely. For the doubled, and as it twined up-gut is unfolded by the weight of the quick-silver, and the excrements are deprest and thrust forth, and the worms are killed which gave occasion to this affect. *John* of S. *Germans*, that most worthie Apothecarie, hath told mee that hee saw a Gentleman, who when as hee could not bee free'd from the pain of the colick by anie means prescribed by learned Physicians, at length by the counsel of a certain German his friend, drank three ounces of oil of sweet almonds drawn without fire, and mixed with som white wine and pellitorie-water, and swallowed a leaden bullet besmeared with quick-silver, and that bullet coming presently out by his fundament, hee was wholly free'd from his colick.

Why glysters in the collick must bee given in les quantitie.

Specifick medicines.

The cure of a cholerick collick.

The force of quick-silver in the unfolding of the guts.

An historie.

CHAP. LIX.

Of Phlebotomie, or Blood-letting.

PHlebotomie is the opening of a vein, evacuating the blood with the rest of the humors; thus Arteritomie, is the opening of an arterie. The first scope of phlebotomie is the evacuation of the blood offending in quantitie, although oft-times the Physician's intention is to draw forth the blood which offend's in qualitie, or either way by opening a vein. Repletion, which is caused by the quantitie, is two-fold; the one *ad vires*, that is, to the strength, the veins beeing otherwise not verie much swelled; this make's men infirm and weak, nature not able to bear his humor, of what kinde soever it bee. The other is termed *ad vasa*, that is, to the vessels, the which is so called comparatively to the plentie of blood, although the strength may verie well away therewith. The vessels are oft-times broke by this kinde of repletion, so that the patient cast's and spit's up blood, or else evacuate's it by the nose, womb, hemorrhoids, or *varices*. The repletion which is *ad vires*, is known by the heavines and weari-

What Phlebotomie is.

The use.

Repletion two-fold.

The signs.

somnes

ſomneſs of the whole bodie; but that which is *ad vaſa*, is perceived by their diſtenſion and fulneſs, both of them ſtand in need of evacuation. But blood is onely to bee let by opening a vein, for five reſpects: the firſt is to leſſen the abundance of blood, as in phletorick bodies, and thoſe who are troubled with inflammation without anie plenitude. The ſecond is for diverſion, or revulſion, as when a vein of the right is opened to ſtay the bleeding of the left noſtril. The third is, to allure or draw down: as when the *ſaphena* is opened in the ankle, to draw down the courſes in women. The fourth is for alteration or introduction of another qualitie; as when in ſharp fevers wee open a vein to breath out that blood which is heated in the veſſels, and cooling the reſidue which remain's behinde. The fifth, is to prevent imminent diſeaſes; as when in the Spring and Autumn wee draw blood by opening a vein in ſuch as are ſubject to ſpitting of blood, the ſquinancie, plurifie, fallingſickneſs, apoplexie, madneſs, gout, or in ſuch as are wounded, for to prevent the inflammation which is to bee feared. Before blood-letting, if there bee anie old excrements in the guts, they ſhall bee evacuated by a gentle glyſter, or ſuppoſitorie, leaſt the meſaraick veins ſhould thence draw unto them anie impuritie. Bloud muſt not bee drawn from ancient people, unleſs ſom preſent neceſſitie require it, leaſt the native heat, which is but languid in them, ſhould bee brought to extreme debilitie, and their ſubſtance decay; neither muſt anie in like ſort bee taken from children, for fear of reſolving their powers by reaſon of the tenderneſs of their ſubſtance, and rareneſs of their habit. The quantitie of blood which is to bee let, muſt bee conſidered by the ſtrength of the patient, and greatneſs of the diſeaſ: therefore if the patient bee weak, and the diſeaſ require large evacuation, it will bee convenient to part the letting of blood, yea by the interpoſition of ſom daies. The vein of the forehead beeing opened is good for the pain of the hind part of the head; yet firſt wee foment the part with warm water, that ſo the skin may bee ſofter, and the blood drawn into the veins in greater plentie. In the ſquinancie, the veins which are under the tongue muſt bee opened aſſant, without putting anie ligatures about the neck, for fear of ſtrangling. Phlebotomie is neceſſarie in all diſeaſes which ſtop or hinder the breathing, or take away the voice or ſpeech, as likewiſe in all contuſions by a heavie ſtroke, or fall from high, in an apoplexie, ſquinancie, and burning fever, though the ſtrength bee not great, nor the blood faultie in quantitie or qualitie; blood muſt not bee let in the height of a fever. Moſt judg it fit to draw blood from the veins moſt remote from the affected and inflamed part, for that thus the courſ of the humors may bee diverted, the next veins on the contrarie beeing opened, the humors may bee the more drawn into the affected part, and ſo increaſ the burden and pain. But this opinion of theirs is verie erroneous, for an opened vein alwaies evacuate's and burden's the next part. For I have ſundrie times opened the veins and arteries of the affected part, as of the hands and feet in the Gout of theſe parts; of the temples in the Megrim; whereupon the pain alwaies was ſomwhat aſſwaged, for that together with the evacuated blood, the malignitie of the Gout, and the hot ſpirits (the cauſers of the Head-ach or Megrim) were evacuated. For thus *Galen* wiſheth to open the arteries of the temples in a great and contumacious defluxion falling upon the eies, or in the Megrim, or Head-ach.

Five ſcopes in letting blood.

From whence wee muſt not draw blood.

When and for what it is neceſſarie.

13. *meth. cap. ult.*

CHAP. LX.

How to open a vein, or draw blood from thence.

How to place the patient.

THe firſt thing is, to ſeat or place the patient in as good a poſture as you can, to wit, in his bed, if hee bee weak; but in a chair, if ſtrong; yet ſo, that the light may fall directly upon the vein which you intend to open. Then the Surgeon ſhall rub the arm with his hand, or a warm linnen cloth, that the blood may flow the more plentifully into the vein. Then hee ſhall binde the vein with a ligature a little above the place appointed to bee opened, and hee ſhall draw back the blood upwards towards the ligature from the lower part; and if it bee the right arm, hee ſhall take hold thereof with his left hand; but if the left, then with his right hand, preſſing the vein in the mean time with his thumb a little below the place where you mean to open it, leaſt it ſhould ſlip away; and that it may bee the more ſwoln by forcing up the blood. Then with his nail hee ſhall mark or deſign the place to bee opened, and ſhall anoint it, beeing ſo marked, with butter or oil, whereby the skin may bee relaxed, and the lancet enter more eaſily, and therefore the ſection may bee the leſs painful. Hee ſhall hold his lancet between his thumb and fore-finger, neither too near, nor too far from the point; hee ſhall reſt his other three fingers upon the patient's arm, that ſo his hand may bee the more ſteddie, and leſs trembling. Then ſhall hee open the vein with an inciſion agreeable to the magnitude of the veſſel, and the indifferent thickneſs of the contained blood, ſomwhat aſſant, diligently avoiding the arterie which lie's under the *Baſilica*, and the nerv, or tendon of the two-headed muſcle, which lie's under the Median vein. But for the Cephalick, it may bee opened without danger. As much blood as is ſufficient beeing drawn, according to the minde of the Phyſician, hee ſhall looſ the ligature, and laying a little bolſter under

Rubbing the arm.

Bindeing it before wee open the vein.

Why the *Baſilica* and Median may not bee opened ſo ſafely as the Cephalick.

under, hee shall with a ligature binde up the wounded part to stay the bleeding, the ligature shall bee neither too straight, nor loose, but so that the patient may freely bend and extend his arm; wherefore whil'st that is in doing, hee must not hold his arm straight out, but gently bended, otherwise hee cannot freely bend it. The bindeing up after blood-letting.

The figure of a Lancet to let blood withall.

CHAP. LXI.

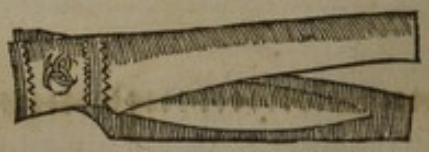
Of Cupping-glasses, or Ventoses.

Cupping-glasses are applied especially when the matter conjunct and impact in anie part is to bee evacuated, and then chiefly there is place for scarification after the Cupping-glasses: yet they are also applied for revulsion and diversion; for when an humor continually flow's down into the eies, they may bee applied to the shoulders with a great flame, for so they draw more strongly and effectually. They are also applied under women's breasts, for to stop the courses flowing too immoderately, but to their thighs, for to provoke them. They are also applied to such as are bit by venemous beasts, as also to parts possessed by a pestiferous *Bubo* or Carbuncle, so to draw the poison from within outwards. For (as *Celsus* saith) a Cupping-glass where it is fastned on, if the skin bee first scarified, draw's forth blood; but if it bee whole, then it draw's spirit. Also they are applied to the bellie, when anie gross or thick windines shut up in the guts, or membranes of the muscles of the *Epigastrium*, or lower bellie causing the colick, is to bee discussed. Also they are fastned to the *Hypocondrie's*, when as flatulencie in the liver, or spleen, swell's up the entrail lying there-under, or in too great a bleeding at the nose. Also they are set against the reins in the bottom of the bellie, whereas the ureters run down to draw down the stone into the bladder, when as it stop's in the middle or entrance of the ureter. You shall make choice of greater and lesser Cupping-glasses, according to the condition of the part, and the contained matter. But to those parts whereto these cannot by reason of their greatnes bee applied, you may fit horns for the same purpose. The use of Cupping-glasses. *Lib.8 cap.1.*

The

The figures of Cupping-glasses of different bigness, with little holes in their bottoms, which shall bee stopped with wax, when you apply them to the part; but opened when you would take them off, that so the air may enter in with the more ease.

A Lancet.



Horns

Horns which without fire, by onely sucking at the upper hole, draw from the part lying under them.

CHAP. LXII.

Of Leeches, and their use.

The use of Leeches.

IN those parts of the bodie whereto Cupping-glasses and horns cannot bee applied, to those Leeches may for the most part bee put, as to the fundament, to open the coat of the hemorrhoid veins, to the mouth of the womb, the gums, lips, nose, fingers. After the Leech, beeing filled with blood, shall fall off, if the diseas require a large evacuation of blood, and the part affected may endure it, Cupping-glasses, or Horns, or other Leeches shall bee substituted. If the Leeches bee handled with the bare hand, they are angred, and becom so stomachful, as that they will not bite; wherefore you shall hold them in a white and clean linnen cloth, and applie them to the skin, beeing first lightly scarified, or besmeared with the blood of som other creature; for thus they will take hold of the flesh, together with the skin more greedily and fully. To caus them fall off, you shall put som powder of aloës, salt or ashes upon their heads. If anie desire to know how much blood they have drawn, let him sprinkle them with salt made into powder, as soon as they are com off; for thus they will vomit up what blood soever they have sucked. If you desire they should suck more blood then they are able to contain, cut off their tails as they suck, for thus they will make no end of sucking, for that it run's out as they suck it. The Leeches, by sucking, draw the blood not onely from the affected part whereto they are applied, but also from the adjacent and distant parts. Also somtimes the part bleed's a good while after the Leeches bee fallen away, which happen's not by scarification after the application of Cupping-glasses or Horns. If you cannot stop the bleeding after the falling away of the Leeches, then pres the half of a bean upon the wound, until it stick of it self, for thus it will stay; also a burnt rag may bee fitly applied with a bolster and fit ligature.

How to applie them.

How to caus them to fall off.

The end of the seventeenth Book.

Of the GOUT.

The eighteenth Book.

CHAP. I.

The description of the Gout.

What it is.

THE Gout is a diſeaſ occupying and harming the ſubſtance of the Joints by the falling down and collection of a virulent matter accompanied by four humors. This word *Arthritis* or Gout, is general for everie joint ſo affected; yet it enjoie's diverſ particular names in ſundrie joints of the bodie: as that which falleth upon the joint of the Jaw, is termed *Siagonagra*, for that the Greeks call the Jaw *Siagon*; that which affect's the neck is termed *Trachelagra*, for that the neck is termed *Trachelos*: that which trouble's the back-bone is called *Rhachiſagra*, for the ſpine is termed *Rhachis*: that which moleſt's the ſhoulders *Omagra*, for the joint of the ſhoulder is called *Omos*: that which affect's the joint of the Collar-bones *Cleiſagra*, for that the Greeks call this bone *Cleis*: that in the Elbow, *Pechyagra*, for *Pechys* ſignifieth the elbow: the gout in the hand is called *Chiragra*, in the Hip *Iſchias*, in the knee *Gonagra*, in the feet *Podagra*, for that the Hand, Hip, Knee, and Foot are in Greek termed, *Cheir*, *Iſchion*, *Gony*, and *Pous*. When as there is great abundance of humors in a bodie, and the patient lead's a ſedentarie life, not ſom one, but all the joints of the bodie are at once troubled with the Gout.

Particular Gouts.

CHAP. II.

Of the occult cauſes of the Gout.

THE humor cauſing the Gout is not of a more known, or eaſily expreſt nature then that which cauſeth the plague, *Lues venerea*, or falling ſickneſs. For it is of a kinde and nature clean different from that which cauſ a *Phlegmon*, *œdema*, *eryſipelas*, or *Scirrhus*; for, as *Aëtius* ſaith, it never cometh to ſuppuration like other humors, not for that, as I think, becauſ it happen's in bloodleſs parts, but through the occaſion of ſom occult malignitie. Hereto may bee added that the humors which cauſ the fore-mentioned tumors, when as they fall down upon anie part, not then truly when they are turned into *pus* or matter, do they cauſ ſo ſharp pains as that which cauſeth the Gout, for the pain thereof is far more ſharp, then of that humor which cauſeth an ulcerated *Cancer*. Beſides theſe humors, when they fall upon the joints through anie other occaſion, never turn into knots, onely that which cauſeth the Gout in the joints, after it hath fallen thither, is at length hardned into a certain knottie and as it were plaſter-like ſubſtance to bee amended by no remedies. But ſeeing it offend's not the parts by which it flow's down, (no more then the matter which creeping upwards from the lower parts to the brain, cauſſeth the *Epilepſie*) as ſoon as it falleth into the ſpaces of the Joints it cauſſeth cruel pain, one while with heat, another while with cold. For you may ſee ſom troubled with the Gout, who complain that their pained joints are burn't; there are others to whom they ſeem colder then anie ice, ſo that they cannot bee ſufficiently heated to their heart's deſire; verily you may ſomtimes ſee in the ſame bodie troubled with the Gout, that the Joints of the right ſide will as it were burn with heat, but on the left ſide will bee ſtiff with cold; or which is more, the knee in the ſame ſide to bee tormented with a hot diſtemper, and the ancle troubled with a cold. Laſtly, there ſomtimes happen's a ſucceſſion of pain in a ſucceſſion of daies, as the ſame joints will bee this day troubled with a hot, to morrow with a cold diſtemper, ſo that wee need not marvel to ſee Phyſicians preſcribe one while hot, another while cold medicines againſt the ſame diſeaſ of the ſame part and bodie. Alſo it ſomtimes happen's that the malignitie of this humor doth not onely not yeeld to medicines, but it is rather made worſ, ſo that the patients affirm that they are far better when they have none, then when they have anie remedies applied. For all things beeing rightly don, and according to reaſon, yet the diſeaſ will com again at certain ſeaſons by fits; and hereupon it is ſaid by *Horace*:

Lib. 1 cap. 12.

The reſemblance of the Gout to the Epilepſie.

The ſtrange varietie of the Gout.

Qui cupit, aut metuit, juvat illum ſic domus aut res,
Vt lippum pictæ tabulæ, fomenta podagram.
Riches the covetous, and fearful ſo do pleaſ,
As pictures ſore eies, Bathes the Gout do eaſ.

Certain-

Certainly ſuch as have this diſeaſ hereditarily, can no more bee helped and throughly free'd therefrom, then thoſe in whom the matter of the diſeaſ is becom knottie, whereof *Ovid* thus ſpeaketh:

Tollere nodoſam neſcit medicina podagram.
Phyſick the knottie Gout it cannot heal.

Theſe reaſons have induced manie to believ that the eſſence of this diſeaſ is unknown, for there is a certain occult and inexplicable virulencie, the autor of ſo great malignitie and contumacie. Which *Avicen* ſeem's to acknowledg, when hee write's that there is a certain kinde of Gout whoſe matter is ſo acute and malign, that if it at anie time bee augmented by the force of anger, it may ſuffice to kill the partie by ſudden death. Therefore *Galen* himſelf write's that Treacle muſt bee uſed in all Arthritical and gountie affects, and as I think, for no other reaſon, then for that it drie's, waſt's and weaken's the malignitie thereof. *Gordonius* is of the ſame opinion, but adieth withall, that the bodie muſt bee prepared and purged before wee uſe Treacle. Therefore the matter of the Gout is a thin and virulent humor, yet not contagious, offending in qualitie rather then quantitie, cauſing extreme pains, and therefore inſtigateing the humors together with the caliginous and flatulent ſpirits prepared or readie for defluxion upon the affected parts. Therefore as the biteings of Aſps, and ſtinging of Waſps cauſ cruel pain with ſudden ſwelling and bliſtering, which is by the heat of the humors which the poiſon hath tainted, and not by the ſimple ſolution of continnitie, ſeeing that wee daily ſee Shoo-makers and Tailors pricking their fleſh with aules and needles without haveing anie ſuch ſymptom; So the virulencie of the gout cauſeth intolerable tormenting pain, not by the abundance, becauſ it happen's to manie who have the gout, no ſign of defluxion appearing in the joints, but onely by a malign and inexplicable qualitie, by reaſon whereof theſe pains do not ceaſ unleſs abated by the help of medicines, or nature, or both. The recital of the following hiſtories will give much light to that inexplicable and virulent malignitie of the matter cauſing the Gout. Whil'ſt King Charls the the ninth of happie memorie, was at Burdeaux, there was brought to *Chappellain* and *Caſtellan* the King's Phyſicians, and *Taſte* a Phyſician of Burdeaux, *Nicolas Lambert* and my ſelf Surgeons, a certain Gentlewoman ſom fortie yeers old, exceedingly troubled for manie yeers by reaſon of a tumor ſcarce equalling the bigneſs of a peaſ, on the outſide of the joint of the left Hip: one of her tormenting fits took her in my preſence; ſhee preſently began to crie and roar, and raſhly and violently to throw her bodie this way and that way, with motions and geſtures above a woman's, yea a man's nature. For ſhee thruſt her head between her legs, laid her feet upon her ſhoulders, you would have ſaid ſhee had been poſſeſſed of the Divel. This fit held her ſom quarter of an hour; dureing all which time I heedfully obſerved whether the grieved part ſwelled anie bigger then it was acuſtomed, whether there happned anie new inflammation; but there was no alteration as far as I could gather by ſight or feeling, but onely that ſhee cried out more loudly when as I touched it. The fit paſſed, a great heat took her, all her bodie ran down with ſweat, with ſo great wearineſs and weakneſs of all her members, that ſhee could not ſo much as ſtir her little finger. There could bee no ſuſpicion of an Epileptick, for this woman all the time of her agonie did perfectly make uſe of all her ſenſes, did ſpeak, diſcourſ, and had no convulſion. Neither did ſhee ſpare anie coſt or diligence, whereby ſhee might bee cured of her diſeaſ by the help of Phyſicians or famous Surgeons; ſhee conſulted alſo with witches, wizzards and charmers, ſo that ſhee had left nothing unattempted, but all art was exceeded by the greatneſs of the diſeaſ. When I had ſhewed all theſe things at our conſultation, wee all with one conſent were of this opinion, to applie a potential Cauterie to the grieved part, or the tumor. I my ſelf applied it: after the fall of the Eſchar verie black and virulent *ſanies* flowed out, which free'd the woman of her pain and diſeaſ for ever after. Whence you may gather, that the cauſ of ſo great evil was a certain venenate malignitie, hurting rather by an inexplicable qualitie then quantitie; which beeing overcom and evacuated by the Cauterie, all pain abſolutely ceaſed. Upon the like occaſion, but on the right arm, the wife of the Queen's Coach-man at Amboiſ conſulted *Chappellain*, *Caſtellan* and mee, earneſtly craveing eaſ of her pain, for ſhee was ſo grievouſly tormented by fits, that through impatiencie, beeing careleſs of her ſelf, ſhee endeavored to caſt her ſelf headlong out of her chamber window, for fear whereof ſhee had a guard put upon her. Wee judged that the like monſter was to bee aſſaulted with the like weapon, neither were wee deceived, for uſeing a potential Cauterie, this had like ſucceſs as the former. Wherefore the bitterneſs of the pain of the gout is not occaſioned by the onely weakneſs of the joints, for thus the pain ſhould bee continual, and alwaies like it ſelf; neither is it from the diſtemper of a ſimple humor, for no ſuch thing happen's in other tumors of what kinde ſoever they bee of; but it proceed's from a venenate, malign, occult and inexplicable qualitie of the matter: wherefore this diſeaſ ſtand's in need of a diligent Phyſician and a painful Surgeon.

Lib. 3. fenn. 22. tract. 2. cap.

Lib. de ther. ad Piſonem c. 15.

The matter of the gout partake's of occult malignitie.

An hiſtorie.

A terrible fit.

How an Epileptick fit differ's from the Gout.

CHAP.

CHAP. III.

Of the manifeſt cauſes of the Gout.

The firſt primitive cauſ of the Gout.

ALthough theſe things may bee true which wee have delivered of the occult cauſ of the Gout, yet there bee and are vulgarly aſſigned others, of which a probable reaſon may bee rendred, wherein this malignitie, whereof wee have ſpoken, lie's hid and is ſeated. Therefore as of manie other diſeaſes, ſo alſo of the Gout there are aſſigned three cauſes; that is, the primitive, antecedent, and conjunct: the primitive is twofold, one drawn from their firſt original and their mother's womb, which happen's to ſuch as are generated of Goutie parents, chiefly if whil'ſt they were conceived, this goutie matter did actually abound and fall upon the joints. For the ſeed fall's from all the parts of the bodie, as ſaith *Hippocrates*, and *Ariſtotle* affirm's *lib. de gen. animal.* Yet this cauſe's not an inevitable neceſſitie of haveing the Gout, for as manie begot of ſound and healthful parents ase taken by the Gout by their proper and primarie default; ſo manie live free from this diſeaſ, whoſe Fathers notwithſtanding were troubled therewith. It is probable that they have this benefit and priviledg by the goodneſs of their Mother's ſeed, and the laudable temper of the womb; whereof the one by the mixture and the other by the gentle heat, may amend and correct the faults of the paternal ſeed; for otherwiſe the diſeaſ would becom hereditarie, and goutie perſons would neceſſarily generate goutie; for the ſeed followeth the temper and complexion of the partie generateing, as it is ſhewed by *Avicen.* Another primitive cauſ is from inordinate diet, eſpecially in the uſe of meat, drink, exerciſe and Venerie. Laſtly, by unprofitable humors which are generated and heaped up in the bodie, which in proceſs of time acquire a virulent malignitie; for theſe fill the head with vapors raiſed up from them, whence the membranes, nervs and tendons, and conſequently the joints becom more lax and weak. They offend in feeding who eat much meat, and that of ſundrie kindes at the ſame meal, who drink ſtrong wine without anie mixture, who ſleep preſently after meat, and which uſe not moderate exerciſes; for hence a plenitude, an obſtruction of the veſſels, cruditites, and the encreaſ of excrements, eſpecially ſerous. Which if they flow down unto the joints, without doubt they cauſ this diſeaſ; for the joints are weak either by nature or accident in compariſon of the other parts of the bodie: by nature, as if they be looſ & ſoft from their firſt original: by accident, as by a blow, fall, hard travelling, runing in the ſun by day, in the cold by night, racking, too frequent Venerie, eſpecially ſuddenly after meat; for thus the heat is diſſolved by reaſon of the diſſipation of the ſpirits cauſed in the effuſion of ſeed, whence manie crude humors, which by an unſeaſonable motion are ſent into the ſinews and joints. Through this occaſion old men, becauſ their native heat is the more weak, are commonly troubled with the Gout. Beſides alſo the ſuppreſſion of excrements accuſtomed to bee avoided at certain times, as the courſes, hemorhoids, vomit, ſcouring, cauſeth this diſeaſ. Hence it is, that in the opinion of *Hippocrates*, A woman is not troubled with the Gout, unleſs her courſes fail her. They are in the ſame caſe who have old and runing ulcers ſuddenly healed, or *varices* cut and healed, unleſs by a ſtrict courſ of diet they hinder the generation and encreaſ of accuſtomed excrements. Alſo thoſe which recover of great and long diſeaſes, unleſs they bee fully and perfectly purged, either by nature or art, theſe humors falling into the joints, wch are the reliques of the diſeaſ, make them to becom goutie: and thus much for the primitive cauſ. The internal or antecedent cauſ is, the abundance of humors, the largeneſs of the veſſels and paſſages which run to the joints, the ſtrength of the amandating bowels, the looſneſs, ſoftneſs and imbecilitie of the receiving jonits. The Conjunct cauſ is the humor it ſelf impact and ſhut up in the capacities and cavities of the joints. Now the unprofitable humor, on everie ſide ſent down by the ſtrength of the expulſive faculties, ſooner linger's about the joints, for that they are of a cold nature and denſ, ſo that once impact in that place, it cannot bee eaſily digeſted and reſolved. This humor then cauſeth pain by reaſon of diſtention or ſolution of continuitie, diſtemper, and beſides the virulencie and malignitie which it acquire's. But it favor's of the nature ſomtimes of one, ſomtimes of more humors; whence the Gout is either phlegmonous, or eryſipilatous, edematous, or mix't. The concourſ of flatulencies, together with the flowing down humors, and as it were tumult by the hinderance of tranſpiration, encreaſeth the dolorifick diſtention in the membranes, tendons, ligaments and other bodies wherein the joint conſiſt's.

Lib. de aere, loc. & aqua. Lib. 1. cap. 17.

Lib. 3. ſen. 2. tract. 2. cap. 5.

Another primitive cauſ of the Gout.

Aph. 19. Sect. 9.

The antecedent cauſ of the Gout.

The conjunct.

Five cauſes of the pain of the Gout.

CHAP. IV.

Out of what part the matter of the Gout may flow down upon the joints.

What and how the matter of the gout com's down from the brain.

THe matter of the Gout cometh for the moſt part fom the liver, or brain; that which deſcend's from the brain is phlegmatick, ſerous, thin and clear, ſuch as uſually drop's out of the noſe, endued with a malign and venenate qualitie. Now it paſſeth out by the muſcu-

muſculous skin and *pericranium*, as alſo through that large hole by which the ſpinal marrow, the brain's ſubſtitute, is propagated into the ſpine, by the coats and tendons of the nervs into the ſpaces of the joints, and it is commonly cold. That which proceed's from the liver is diffuſed by the great vein and arteries filled and puffed up, and participate's of the nature of the four humors, of which the maſs of the blood conſiſt's, more frequently accompanied with an hot diſtemper, together with a goutie malignitie. Beſides this manner of the Gout, which is cauſſed by defluxion, there is another which is by congeſtion; as, when the too weak digeſtive facultie of the joints cannot aſſimilate the juices ſent to them.

Gout by congeſtion.

CHAP. V.

The ſigns of the Arthritick humor flowing from the brain.

When the defluxion is at hand, there is an heavineſs of the head, a deſire to reſt, and a dulneſs with the pain of the outer parts, then chiefly perceptible, when the hairs are turned up, or backwards; moreover, the muſculous skin of the head is puffed up as ſwoln with a certain œdematous tumor; the patients ſeem to bee much different from themſelvs by reaſon of the functions of the minde hurt by the malignitie of the humor, from whence the natural faculties are not free; as the crudities of the ſtomach, and the frequent and acrid belchings may teſtifie.

CHAP. VI.

The ſigns of a goutie humor, proceeding from the liver.

The right Hypocondrie is hot in ſuch goutie perſons, yea the inner parts are much heated by the bowel; blood and choler carrie the ſway, the veins are large and ſwoln, a defluxion ſuddenly fall's down, eſpecially if there bee a greater quantitie of choler then of other humors in the maſs of the blood. But if, as it often fall's out, the whole blood, by means of crudities degenerate into phlegm and a whayiſh humor; then will it com to paſs, that the Gout alſo, which proceed's from the liver, may bee pituitous or phlegmatick, and participate of the nature of an *anaſarca*, like that which proceed's from the brain. As if the ſame maſs of blood decline towards melancholie, the Gout which thence ariſeth, reſemble's the nature of a *ſcirrhus*; yet that can ſcarce happen, that melancholie by reaſon of the thickneſs and ſlowneſs to motion may fall upon the joints. Yet notwithſtanding, becauſe wee ſpeak of that which may bee of theſe, it will not bee unprofitable briefly to diſtinguiſh the ſigns of each humor, and the differences of Gouts to bee deduced from thence.

When the Gout, which proceed's from the default of the liver, aſſimilate's the nature of an *œdema*.

Why the Gout ſeldom proceed's from melancholie.

CHAP. VII.

By what ſigns wee may underſtand this or that humor to accompanie the goutie malignitie.

You may give a gueſs hereat by the patient's age, temper, ſeaſon of the year, condition of the countrie where hee live's, his diet and condition of life, the increaſe of the pain in the morning, noon, evening or night, by the proprietie of the beating, pricking, ſharp or dull pain; by numneſs, as in a melancholie gout or itching; as in that which is cauſſed by tough phlegm, by the ſenſible appearance of the part in ſhape and color (as for example ſake in a phlegmatick Gout, the color of the affected part is verie little changed from its ſelf and the neighboring well parts, in a ſanguine Gout it look's red, in a cholerick it is fierie or pale, in a melancholie livid or blackiſh) by the heat and bigneſs which is greater in a ſanguine and phlegmatick then in the reſt, by the change: and laſtly, by things helping and hurting. And there bee ſom, who for the knowledg of theſe differences, wiſh us to view the patient's urine, and feel their pulſ, and conſider theſe excrements, which in each particular nature are accuſtomed to abound or flow, and are now ſuddenly and unaccuſtomarily ſuppreſt. For hence may bee taken the ſigns of the dominion of this or that humor. But a more ample knowledg of theſe things may bee drawn from the humors predominant in each perſon, and the ſigns of tumors formerly delivered. Onely this is to bee noted by the way, that the Gout which is cauſſed by melancholie, is rare to bee found.

CHAP. VIII.

Prognoſticks in the Gout.

BY the writeings of Phyſicians the pains of the Gout are accounted amongſt the moſt grievous and acute; ſo that through vehemencie of pain manie are almoſt mad, and wiſh themſelvs dead. They have certain periods and fits, according to the matter and condition of the humor wherin this malign and inexplicable goutie virulencie reſide's. Yet they more frequently invade in the Spring and Autumn; ſuch as have it hereditarie are ſcarce ever throughly free therfrom, as neither ſuch as have it knottie: for in the former it was born with them, and implanted, and as it were fixed in the original of life; but in the other, the matter is becom plaſter-like, ſo that it can neither bee reſolved nor ripened. That which proceed's from a cold and pituitous matter, cauſſeth not ſuch cruel tormenting pain, as that which is of an hot, ſanguine or cholerick cauſ, neither is it ſo ſpeedily healed, for that the hot and thin matter is more readily diſſolved; therfore commonly it ceaſeth not until fortie daies bee paſt: Beſides alſo, by how much the ſubſtance of the affected part is more denſ, and the expulſive facultie more weak, by ſo much the pain is more tedious. Hence it is, that thoſe goutie pains which moleſt the knee, heel and huckle-bone, are more contumacious. The Gout which proceed's of an hot matter, reſt's not before the fourteenth or twentieth daie. That which is occaſioned by acrid choler, by the bitterneſs of the inflammation and pain cauſſeth a difficultie of breathing, raveing, and ſundrie times a gangrene of the affected part, and laſtly death; and healed, it often leav's a palſie behinde it. Amongſt all the goutie pains, the Sciatica challengeth the prime place, by the greatneſs of the pain and multitude of ſymptoms; it bring's unquietneſs and watching, a fever, diſlocation, perpetual lameneſs, and the decaie of the whole leg, yea and often-times of the whole bodie. Now lameneſs and leanneſs, or decaie of the part are thus occaſioned, for that the decurrent humor forceth the head of the thigh-bone out of the cavitie of the huckle-bone; this beeing forced out preſſeth the muſcles, veins, arteries, and that notable and large nerv which run's along the thigh, even to the furtheſt joints of the toes, and by the waie is diverſly diſperſed over the muſcles of the whole leg: Therfore becauſ the head of the thigh is put out of its place, the patient is forced to halt; becauſ the veſſels and nervs are oppreſſed, the nouriſhment and ſpirits do not freely flow into the parts ther-under, whence proceed's their decaie. Yet it ſundrie times happen's, that the head of the thigh beeing not diſplaced, manie halt becauſ the viſcid humor, which is naturally implanted in that place, and continually flow's thither, both for the nutrition of theſe parts, and the lubrication of the joint for quicker motion, is hardened by heat and idleneſs, and the other unprofitable humors which flow down do there concrete, and ſo intercept the libertie of motion. A groſs and viſcid humor into what joint ſoever it falleth and ſtaieth, doth the ſame. For by concretion it turn's into a plaſter-like nature at or near the joint, poſſeſſing the cavities therof, and it depraveth the figure of the part, makeing it crooked and knotted, which formerly was ſtraight and ſmooth. Furthermore, everie diſtemperature cauſſed by the defluxion of humors, if it ſhall lie long upon anie part, deprave's all the actions, and oft-times wholly aboliſheth them; ſo that there may bee three cauſſes of the leanneſs or decaie of the joint by the Gout, the obſtruction or compreſſion of the veſſels, idleneſs and an hectick diſtemper: but two of lameneſs, diſlocation and the concretion of an adventitious humor impact in the joint. If contrarie to cuſtom and reaſon the pains of the Gout do not go away, or return at their accuſtomed periods, moſt grievous and dangerous diſeaſes theron follow; for the matter accuſtomed to flow down into the joints, if it ſeiz upon the ſubſtance of the liver, cauſſe's a phlegmon; if it ſtaie in the larger veins, a continual fever: if it flow in the membrane inveſting the ribs, a pluriſie; if it betake it ſelf to the guts, and adhere to their coats, the colick, or *Iliaca paſſio*: and to conclude, it produceth divers other ſymptoms, according to the diverſitie of the parts whereto it flow's and abide's. For thus ſundrie that have been troubled with the Gout, becom paralytick, becauſ the matter, which formerly flowed down into the joints, ſtaie's in the ſubſtance and pores of the nervs, and ſo hinder's the ſpirit that it cannot freely in its whole ſubſtance paſs through them: hence therfore com's the reſolution of the part, whereinto the nerv is inſerted. Old men can never bee quite or abſolutely cured of the Gout, for that the maſs of their blood is ſo departed from its primarie and native goodneſs, that it can no more bee reſtored, then dead or ſowred wine. The Gout, which proceed's from a cold cauſ, invadeth ſlowly, and by little and little, and is helped by the uſe of hot things; that which is from an hot matter, quickly ſhew's it ſelf, and is helped by the uſe of cold things. Now, although the Gout more frequently return's in the Spring and Fall, yet it com's in the midſt of winter, the nervs beeing weakned by the exceſs of cold, and the humors preſſed out; otherwhiles in the mid'ſt of Summer, the ſame beeing diffuſed and diſſipated. Laſtly, it com's at anie time or ſeaſon of the year, if thoſe who are ſubject to this diſeaſ feed plenteouſly, and do all things accord-

ing

The Gout frequent in the Spring & Fall.

What Gout uncurable.

Gal. ad aphor. 49. ſect. 5.

Why the Sciatica cauſſeth lameneſs.

Thee cauſſes of the lameneſs or decay of the limbs.

How the Gout turn's into the Palſie.

Why the Gout take's one in winter, and the midſt of ſummer.

ing to their own mindes and desire. Those who are troubled with the Gout, feel and perceiv change of weather, storms, rains, snows, windes, and such like, before they com. A Southerlie constitution of the air, for example, fill's the bodie with humidities, and stir's up the humors that lie quiet in the bodie; and therefore caus desluxions upon the weaker parts, such as the joints, both by nature, as beeing without blood and flesh, as also by accident, for that they a long time have been accustomed to bee so tormented; therefore their pains are increased in a wet season. Manie of these that are troubled with the Gout, desire venerie in the bitterness of their pain, becaus the internal heat wherewith they then are inflamed, doth not dissipate into spirits and air, as the feverish heat doth, but dissolv's, and as it were melt's down the seminal humor, which dissolved, flow's to the genitals, filleth and distend's them. The same thing befall's carriage and running horses, for in these by labor, much heat send's flatulencies to the bottom of the bellie. Yet venerie is verie hurtful to such as are troubled with the Gout, becaus it dissipate's the spirits and native heat, and encreaseth the unnatural heat; whereby it cometh to pass, that the nervous parts are weakned, and the pain exasperated. Rich men, that is, such as feed riotously on varietie of dainties, and in the mean space live idlely and lazily are more frequently and cruelly tormented with the Gout then poor people, who live spareingly and hardly: Wherefore there have been seen not a few of such rich and riotous persons, who haveing spent their estates, have therewith changed their health, together with their fortune and diet, and so have been wholly freed from the Gout.

Why such as have the Gout upon them, do oft-times desire venerie.

Venerie hurtful in the Gout.

CHAP. IX.

The general method of preventing and cureing the Gout.

Those who desire to prevent the Gout, must not glut themselvs with meat, must bee quick to labor, and abstain from wine & venerie, or certainly must not use them, unless for their healths sake, must vomit and purge at certain times. *Hippocrates* write's, that boies are not troubled with the Gout before the use of venerie. Yet at this day manie Eunuchs are seen to have the Gout, but especially those who abound with idleness and pleasure; yet these wee have heretofore mentioned are verie effectual, not onely for the prevention, but also for the cure of the present disease. Yet wee must diligently distinguish the causses, what they bee, and whence they may proceed, and oppose thereto remedies contrarie in quantitie and qualitie. There are absolutely three distinct causses of the Gout: A tainture from the parents; a corruption of the humors by diet and air; a native, or adventitious weakness of the joints. Against these there is a two-fold indication: the first is the evacuation and alteration of the peccant humors, the other the strengthning of the weak joints. These two shall bee performed by diet conveniently appointed, purgeing, blood-letting, provocation of the hemorrhoids, courses, vomit, sweat, urine, and fit application of local medicines. Therefore, when the time shall com, wherein the Gout accustometh to return by cours, the patient shall have a care of himself by a diligent manner of diet, hee shall lessen the matter of the disease by phlebotomie (if that the Gout shall arise from the blood) from the opposite part, that by the same means revulsion and evacuation may bee made; as if the upper parts bee inflamed, blood shall bee drawn from the lower; if on the contrarie the lower, out of the upper, alwaies observing the straightness of the fibres. Thus the right arm beeing troubled with a goutie inflammation, the *Sapheia* of the right leg shall bee opened, and so on the contrarie; but if this general blood-letting beeing premised, the pain shall not ceas, it will bee requisite to open the vein next to the pain, which I have often performed with happie succes.

Aph.30.sect.6.

Two general scopes of cureing the Gout.

Whence blood must bee let in the Gout.

Yet phlebotomie hath not the like effect in all, for it is not available to such as are continually and uncertainly troubled with goutie pains, or whose bodies are weak and cold, wherein phlegm onely is predominant. Wee may say the same of purgeing, for though it bee oft-times necessarie, yet too frequently re-iterated, it prove's hurtful; furthermore, neither of these remedies is usually verie profitable to such as observ no order in meat & drink, which use venerie too intemperately, who abound with crude and contumacious humors; whose joints by long vexation of the disease, have contracted an hectick distemper and weakness, so that they are departed from their natural constitution, and suffered a great change of their proper substance. Wherefore as often as these greater remedies shall bee used a Physician shall bee called, who according to his judgment may determine thereof. For oft-times diet proveth more available then medicines: therefore the patient (if the matter of the Gout bee hot) shall either drink no wine at all, or elss verie much allaied, that is, as much as his custom and the constitution of his stomach can endure. A fit time for purgeing and bleeding is the Spring and Autumn, becaus, according to the opinion of *Hippocrates*, Gouts reign chiefly in these season; in Autumn, for that the heat of the precedent Summer debilitateth the digestive facultie, the native heat beeing dissipated: as also the eating of Summer-fruits hath heaped up plentie of crude humors in the bodie,

What goutie persons finde no benefit by phlebotomie.

In what Gout diet prove's more effectual then medicines.

Aph.55.sect.6.

bodie, which eaſily flow down into the paſſages of the joints opened and dilated by the Summer's heat: add heerunto, that the inequalitie or variableneſs of Autumn weakneth all nervous parts, and conſequently the joints. But in the Spring, for that the humors forced inward, by the coldneſs of the Winter, are drawn forth from the centre to the circumference of the bodie, and beeing attenuated, fall into the joints upon a verie ſmall occaſion, therfore theer is great both neceſſitie and opportunitie for evacuation, which if it ſhall not avert the accuſtomed fit, yet it will make it more gentle and eaſie.

CHAP. X.

Of Vomiting.

To what gout vomiting is to bee uſed.

VOmiting is by all the Antients exceedingly commended, not onely for the prevention, but alſo for the cure, eſpecially when as the matter floweth from the brain and ſtomach; for the phlegmatick, ſerous and cholerick humors, which uſually flow from the joints, are excluded and diverted by vomit, and alſo theer is attenuation of that phlegm, which beeing more thick and viſcid, adhereth to the roots of the ſtomach: yet you muſt conſider and ſee, that the patient bee not of too weak a ſtomach and brain, for in this caſe vomiting is to bee ſuſpected. For the time, ſuch as have excrementitious humors flowing down to the ſtomach through anie occaſion, as by exerciſe and motion, muſt vomit before they eat; on the contrarie, ſuch as are over-charged with an old congeſtion of humors, muſt vomit after they have eaten ſomthing. Certainly, it is ſafer vomiting after meat, then it is before. For the drie ſtomach cannot, unleſs with great contention and ſtraining, free it ſelf from the viſcid humors impact in the coats thereof; and hence there is no ſmall danger of breaking a vein or arterie in the cheſt or lungs, eſpecially if the patient bee ſtraight-cheſted, and long-necked, the ſeaſon cold, and hee unaccuſtomed to ſuch evacuation. I remember that with this kinde of remedie I cured a certain Gentleman of Geneva, grievouſly moleſted with a cruel pain in his ſhoulder, and therby impotent to uſe his left arm; the Phyſicians and Surgeons of Lions ſeemed to omit nothing elſ for his cure. For they had uſed purgeing, phlebotomie, hunger, a diet-drink of *Gudiacum* and *China* (although his diſeaſ was not occaſioned by the *Lues Venerea*) and diverſ other topick medicines, neither yet did they anie thing avail. Now learning by him that hee was not apt to vomit, but that it was difficult to him, I wiſhed him to feed more plentifully, and that of manie and ſundrie meats; as fat meat, onions, leeks: with ſundrie drinks; as beer, ptiſan, ſweet and ſharp wine, and that hee ſhould as it were over-charge his ſtomach at his meal, and preſently after get him to his bed; for ſo it would happen, that nature not endureing ſo great confuſion and perturbation of meats and drinks, wherof ſom weer corrupted alreadie in the ſtomach, and other-ſom ſcarce altered at all, nature not endureing this confuſion and perturbation, would eaſily, and of its own accord provoke the ſtomach to vomit; which that it might the beteer ſucceed, hee ſhould help forward nature's endeavor, by thruſting his finger or a feather into his throat, that ſo the thick and tenacious phlegm might by the ſame means bee evacuated: and not content to do thus once, I wiſhed him to do the like the ſecond and third daie following; for ſo it verifieth that ſaying of *Hippocrates*, *The ſecond and third daie exclude the reliques of the firſt*: afterwards, that hee ſhould vomit twice a month, chaw maſtick faſting, rub his neck and the pained part with *aqua vitæ*, ſtrengthened by infuſing therin lavander, roſemarie, and cloves groſly beaten, confirm his arm by indifferent exerciſe: hee performed all this, and ſo became free from his pain, and recovered the uſe of his arm. Thoſe who do not like ſuch plentiful feeding, ſhall drink a great quantitie of warm water, wherin radiſh roots have been boiled, and they ſhall have a care leaſt by uſing their ſtomachs to this excretion by vomit, they weaken the digeſtive and retentive facultie therof. Wherfore ſuch as can naturally, ſhall think it ſufficient to vomit twice a month.

What time the fitteſt therfore.

An hiſtorie.

How to make one vomit eaſily.

Lib. de rat. victus.

CHAP. XI.

The other general remedies for the Gout.

How diuretick are good for the Gout.

THe defluxion of ſerous humors is verie fitly diverted from the joints by the urine by the uſe of diuretick medicines. Therfore the roots of ſorrel, parſlie, *ruſcus*, *aſparagus*, and graſs, and the like, ſhall bee boiled in broth, and given to ſuch as have the Gout: for when the urine floweth much and thick, the pain is leſſned. Manie have found benefit by iſſues; for the Arthritick malignitie flow's forth of theſe, as by rivelets; experience ſhew's it in ſuch as are troubled with the *Lues Venerea*, for in thoſe that you cannot overcom the malignitie by the proper antidote, that is, Quick-ſilver, they feel no greater eaſ of the pain, then by application of cauſticks, and makeing of iſſues. They ſhall bee made in ſundrie places, according to the difference of the pained joints,

Iſſues or fontanels.

joints, to wit, in the beginning of the neck, if the defluxion proceed from the brain, and fall into the joints of the collar-bones or shoulder; if into the elbow or hand, under the muscle *Epomis*; if into the hip, knees and feet, som three fingers breadth under the knee, on the in-side: for thus theer will follow more plentiful evacuation, by reason that the *Sapheia* runneth down that way. Yet if the patient bee troubled with much business, and must travel much on horse-back, then shall they bee made on the out-side of the leg, between the two bones thereof, that so they may trouble him the less in rideing. If anie had rather use an actual cauterie, let him take such an one as is triangular and sharp, that so hee may with more speed and less pain perform that which hee intend's, and let him thrust it through a plate of iron which hath an hole therein, and let the place bee marked, least hee should err; the ulcer shall bee kept open, by putting in a pill of gold, silver, lint, of the root of orris, hermodactises, gentian, wax, wherwith som powder of vitriol, mercurie or alum shall bee incorporated, least it should fill up with flesh sooner then the Physician shall think fit. In the mean space, the head, oft-times the original of the evil, shall bee evacuated by takeing in the winter the pils *cochiæ*, and *de Assajereth*; but in summer *sine quibus*, or *Imperiales*, before the Full of the Moon. R. *pul. hyeræ simp.* ʒi. *agar. recent. troch. & rhei an.* ʒii. *myrobal. chebul.* ʒß. *tamarind.* ℈ii. *cum infusione sennæ, fiat massa de quâ formentur pill.* vi. *pro dracbmâ*; let the patient take two before supper everie eighth daie; the daie after hee shall drink som broth of the decoction of cicers, and the diuretick roots. Also these following pils will bee good to purge the phlegmatick and serous humor. R. *pillular. fætid. & de hermodactil. an.* ʒß. *formentur cum succo vel syrup. rosar. solut.* Or elss, R. *aloes* ʒiii. *agarici trochis. & rhei, an* ʒi. *massæ pilul. arthrit. & de hermodact. an.* ℈ii. *diacrid.* ℈. *cum melle rosato fiat massa, capiat pondus,* ʒi. as the Physician shall think fit, by whose advice these shall bee used and changed as occasion shall offer it self, and the nature of the humor causing the disease. The day after the purgeing, the patient shall take three hours before meat half a dram of treacle, to strengthen the entrails: pils are preferred before liquid medicines, for that by their long staie in the stomach they easily attract the noxious humor from the brain, and the other more distant parts. I have known som Physicians, who mixing with ordinarie pils a good quantitie of scamonie, as seven or eight grains, with a little ginger, least it should hurt the stomach, have purged by stool a great quantitie of serous humors; the daie following they gave barlie cream to correct the harm which the scamonie may have don to the stomach. Others for the same purpose give treacle, which doth not onely strengthen the entrails, but also weaken's the virulencie of the goutie malignitie; the orifice of the ventricle must bee shut after meat, that so the vapors ascending to the brain may bee restrained: for this purpose common drige-powder, marmelate, or conserv of roses are good. In a wet season use cephalick perfumes thus made: R. *thuris, vernicis, & mastich. an.* ʒi. *granorum juniperi, baccarum lauri, an.* ʒß. *ligni aloes* ʒii. *assæ odoratæ* ʒi.ß. Let them bee grosly beaten; let the fume bee received in tow, or carded cotton, and so applied to the head. Also the excrementitious humors shall bee dried up by the following powder strowed on the patient's head for fifteen daies. R. *fol. ros. rub. sennæ, stæchad. utriusque an.* m.ß. *milii,* ʒiiii. *furfuris loti in vino albo,* ʒiii. *florum chamæm. melil. an.* p.i. *sem. anisi,* ʒi. *salis com.* ʒii. *fiat omnium pulvis.* Let it bee put into linnen bags, with which, beeing warmed at the fire in a frying-pan, and kept with stirring, the head shall bee rubbed. Let the following medicine bee chawed, and kept in the mouth in the form of a masticatorie, in the time of the falling down of the defluxion. R. *cubebarum, nucis moschat. glycyrrhiz. anis. an.* ʒi. *pyrethri,* ʒii. *mastich. rad. staphisagr. eryngii, an.* ʒii. Let them all bee made into powder, and mixed together, and tied up in a little taffatie to the bigness of a hasel-nut, and let them bee rowled up and down the mouth with the tongue to caus spitting or salivation. Working with the hands, and frictions of the arms, especially in the morning after the evacuation of the excrements, are good for such as are troubled with the Gout in the feet, for so, it not onely causeth revulsion from the feet, but also the resolution of that which is unprofitable.

Where to bee made.

An actual cauterie.

Pils.

Common pils with the addition of scamonie.

Treacle, how useful in the Gout.

Cephalick fumigations.

Cephalick bags.

A masticatorie.

CHAP. XII.

What diet is convenient for such as have the Gout.

After the bodie is once fed, they must not return to meat before that the concoction bee perfected in the stomach, least the liver bee forced to draw by the mesaraick veins that which is yet crude and ill digested, and as it were forced thence. Whence the depravation of the nutriment of the whole bodie; for the following decoctions doe not amend the default of the first. Let them make choice of meat of good juice and easie digestion, rosted for such as are phlegmatick, but boiled for such as are cholerick: As they shall shun much varietie one meal, so must they eschue the use of pulses, milk-meats, sallads, and sharp things; as verjuice, vineger, the juice of oranges, and citrons. They shal not eat unless they bee hungrie, & shall desist ther-from before they bee fully satisfied, if it bee but for this, that whil'st the native heat is busied in the digestion of meat plenteously

The fault of the first concoction, is not amended in the after.

plenteously eaten, it is diverted from the concoction of the noxious humors. The flesh of great fowl, as swans, cranes, peacocks are not of laudable juice, and are with more difficultie digested in the stomach. Som of the ancients have disallowed of the eating of capons, and the like birds, becaus they are subject to bee troubled with the Gout in the feet. Fishes are to bee shunned, for that they heap up excrementitious humors, and are easily corrupted in the stomach, yea and relax it by continual use. Of the flesh of beasts, veal is most to bee commended, for that it breed's temperate blood, and laudable juice, and is easily digested. Neither in the mean time is mutton to bee found fault withall. But the like hunger or abstinence must not bee appointed to all men troubled with the Gout, for such as are of a sanguine and cholerick complexion, becaus they are endued with much, and much wasteing heat, are to bee refreshed with more plentiful nourishment; for hunger sharpen's choler, and so augment's their pains; neither in the *interim* must they bee fed with too much moist meats, for too much moisture, besides that it is the autor of putrefaction, will caus defluxions, and draw down the matter to the joints. Therefore the cholerick humor must bee incrassated and refrigerated by takeing things inwardly, and applying things outwardly, least by its tenuitie it should fall down into the grieved parts. To this purpose conduce broths altered with lettuce, purslain, sorel, and the like herbs, and barlie creams made with a decoction of the four cold seeds. Phlegmatick bodies, by reason that they have not so vigorous heat, do as it were carrie their provant about them, wherefore they must not bee fed, neither with manie, nor with moist meats. All that are troubled with the Gout, must shun those things which are hard of digestion, and which are soon corrupted, for they all have a certain remiss fever, which diminisheth the native heat, and make's the meats apt to putrefie. Too plentiful drinking not onely of wine, but also of anie other liquor, is to bee avoided. For by too great a quantitie of moisture the meat float's in the stomach, and the native heat is in som sort extinguished, whence proceed crudities. Som Physicians commend the use of white wine, for that it provoke's urine, which is not altogether to bee disallowed, if so bee that the bodie bee free from excrements, otherwise by this, as it were a vehicle, especially if the temperature of the bodie bee somwhat more hot, they shall bee carried down into the joints. Therefore in such a case I should rather advise them to use claret, which is somwhat weak and astringent, for that it doth not so much offend the head nor joints, and it shut's and strengthen's the orifices of the vessels. Yet it will bee more convenient wholly to abstain therefrom, and instead thereof to drink an *Hydromel* made after this manner: ℞. *aquæ* ℔.iiii. *mellis optimi* q.i. *bulliant ad consumptionem* ℔.i. *bene despumando, adde ad finem, salviæ* p.i. *imò si æger sit pituitosus, cinnamomi aut caryophillorum momentum.* For cholerick persons make a sugred water thus: ℞. *aquæ fontis* ℔.iiii. *saccari* ℔.ß. *colentur per manicam sine ebullitione, addendo in fine cinnamomi* ʒii. For thus the stomach shall also bee strengthened; also hee may drink *ptisan*, wherein at the end of the decoction shall bee boiled som dried roses, or elsse som syrup of pomegranates added thereto, least it should offend the stomach; as soon as it come's from off the fire, let it stand and settle, and then strain it through an hypocras-bag, or clean linnen cloth.

Capons subject to the gout.

Cholerick persons cannot away with long fasting.

Phlegmatick bodies in fasting feed upon themselvs.

White wine not good for the gout.

Claret may bee the safelier drunk.

Hydromel most safely.

An *Hydrosaccarum.*

CHAP. XIII.

How to strengthen the Joints.

IT is a matter of much consequence for the prevention of this evil, to strengthen the joints, whereby they may bee able to resist the humors preternaturally falling down upon them. Wherfore it is good morning and evening to rub them with *oleum omphacinum*, that is, oil made of olives not com to their perfect maturitie; or with oil of roses mixed with common salt finely powdered. It may also bee mixed with common oil, adding thereto the powder of Hart's-horn, as that which hath an astringent and drying facultie. Also it is good to bathe them in this following lee: ℞. *cort. granat. nucum cupress. gallarum, sumach. cortic. querni, an.* ʒii. *salis com. alumin. rocb. an.* ʒi *salviæ, rorismar. lavendul. lauri, ivæ arthretic. an.* m.i. *rosar. rub.* m.ß. *bulliant omnia in sex* ℔. *vini crassi & astringentis, & lixivio parato ex aquâ chalibeatâ, & cinere querno.* Then foment the part with sponges or cotton-cloths; after, this fomentation shall bee carefully wiped and dried with hot linnen cloths, takeing heed of cold. The juice of unripe haws tempered with oxycrate is a singular thing for this purpose. But if you desire to strengthen the joints weakned by a cold caus, then, ℞. *salviæ, rorism. thymi, lavendul. laur. absinth. an.* m.i. *caryophyl. zinzib. piperis, conquassatorum an.* ʒi. *infundantur in aquâ vitæ & vini rubri astringentis, an.* ℔.iiii. *bulliant leniter in balneo mariæ.* With this liquor foment the joints morning and evening. Som think it good to strengthen the joints, to tread grapes in vintage-time, which if they bee not able to do, then let them wash their feet in the must or new pressed wine. Also bags may bee thus made for the same purpose. ℞. *salis com. alum. rocb. cort. granat. sumach. berberis, nucum cupressi, an.* ʒiiii. *fol. salviæ, rorism. rosar. rub. an.* m.ß. Let them bee all put in linnen bags, and boiled in lee, and so make a decoction for to foment the joints.

A fomentation to strengthen the joints.

The juice of haws with oxycrate.

Bags.

CHAP.

CHAP. XIV.

Of the Palliative Cure of the Gout and the material causes thereof.

HEer also must wee consider the causes whence this disease proceed's, the temper of the diseased bodie, the parts affected, and those from whence it proceed's. For as these are not alwaies alike, so neither can one and the like remedie bee useful in everie Gout. For first those which proceed of a cold cause require other remedies, then those which arise from a hot, and that which proceed's from anie one simple humor, then that from wch ariseth diverse mixed together. For Choler alone causeth cruel pains, but tempered by the admixture of Phlegm, it becom's more gentle. Furthermore som remedies are good in the beginning, som in the encrease, and som at other times. Neither may wee use repercussives in the Sciatica, as wee may in the Gout of the feet and other joints; unless peradventure the part bee fearfully inflamed. Takeing these things to consideration wee must observ that the Palliative cure of that Gout, which cannot absolutely bee helped, as that which is hereditarie and inveterate, is performed by four scopes. The first is by appointing a convenient diet in the *six things* wch are termed *not-natural*. The second by evacuateing & diverting the antecedent matter, both by purgeing and phlebotomie. The third by topick medicines according to the condition of the morbifick humor and nature. The fourth by correcting the symptoms, but especially the pain, whereof in these affects there is oft-times so great excess by reason of the inexplicable and invincible malignitie of the virulent qualitie associateing the humor that it alone is oft-times sufficient to kill the patient. And becaus the varietie of morbifick causes, bring's a varietie of remedies, fitted to these four intentions, therefore it behoov's a Physician to bee most attentive in the distinction of the causes. For hee may bee easily deceived and mistake one for another; for arthritick pains proceeding from a cold matter, if they bee mitigated by the application of Narcotick and cold medicines, it may induce us to believ that the material caus is hot, though really it bee not so; for Narcoticks asswage pain, not for that they are contrarie to the caus thereof, but becaus they take away the sens by induceing a numness; on the contrarie, the material caus may somtimes seem cold, which notwithstanding is hot, for that it becom's better by application of hot medicines, that is, by takeing an argument from that which help's, becaus contraries are cured by contraries, and the like preserved by the like. But herein consist's the error, for that hot medicines profit not by their contrarietie, but by the attenuation of the gross matter, by the rarefaction of the skin and dissipateing them into air. Whence you may gather, that an argument drawn from that which help's and hurt's, is verie deceitful: moreover it may happen that a large quantitie of cold matter flowing down from the brain, may caus great pain by reason of the virulencie, and a small quantitie of choler mixed therewith, which serv's for a *vehicle* to carrie down the tough and slow phlegm into the joints, whence the patient becom's thirstie and severith by reason of the heat and inflammation of these parts, wherby such as are less cautelous and heedie will easily bee induced to beleev that som hot matter is the occasion of this Gout. Now when as not som one simple humor but different by reason of mixture, causeth the Gout, the yellowish color of the part may deceiv one, as, if the evil matter should proceed from choler onely, which by the tenuitie of its substance leaving the center, easily possesseth the circumference of the bodie or part: and notwithstanding much phlegm beeing as it were enraged by the admixtion of a little choler, may bee the chief caus of the disease, and may peradventure bee discovered by the encrease of pain in the night season. A fever ariseing by means of pain and watching may encrease the conceived opinion of choler, which attenuateing and diffuseing the humors, drive's them into the joints, and causeth fierie urines, tinctured with much choler, and a quick puls. Yet notwithstanding the Physician shall bee in an error, if deceived with these appearances, hee attempt the cure of this Gout, as ariseing from a hot, and not from a cold caus: yet I am not ignorant that the cure of the proper disease must bee neglected for the cure of the symptoms. Besides also it may com to pass that choler may bee the caus of the Gout, aud notwithstanding no signs thereof may appear in the skin and surface of the affected part, becaus the coldness of the ambient air, and the force of applied Narcoticks may have destroied the color of the juices lying therunder, and as it were imprinted a certain blackness. It also happen's, that the bodie beeing over-charged with a great quantitie of gross and viscid humors, the expulsive facultie may discharge som portion thereof unto the joints, but leav the rest impact in the cavitie of som entrail, where causing obstruction and putrefaction may presently caus a fever, and that intermitting, if it bee small, and obstruct onely the lesser veins, and these of the habit of the bodie. Wherfore then it is not sufficient that the Physician employ himself in the cure of the Gout, but it behoov's him much more to attend the cure of the fever, which if it bee continual, it discredit's the Physician, and endanger's the patient; if it bee intermitting, it easily becom's continual, unless it bee withstood with fit remedies, that is, unless you let blood, the bellie beeing first gently purged, and nature bee presently free'd by a stronger purge

The scopes of cureing.

Repercussives not to bee used in the *Sciatica*.

The palliative cure performed by four scopes.

An argument taken from that which helpeth or giveth eas, is not alwaies certain.

How cold diseases may bee helped by cold. and hot, by hot medicines.

The first thing that may deceiv a Physician.

The second.

The third.

The fourth.

The fifth.

The sixth.

Why ſtrong purges muſt be given to ſuch as have the Gout.

That judgment moſt certain which reſt's upon multiplicitie of ſigns.

Why wee muſt uſe purgeing and bleeding in the Gout.

Lib. de affect. ubi de Artbrit loquitur. Adapb. 23. ſect. 1. Lib. de cur. per ſang. miſſionem.

purge of the troubleſom burden of humors. Now it is convenient, the purge bee ſomwhat ſtronger then ordinarie, for if it ſhould bee too weak, it will ſtir up the humors, but not carrie them away, and they thus agitated will fall into the pained and weak joints, and cauſ the Gout to encreaſ, By this it appear's how deceitful that conjecture is,, which relie's and is grounded on one ſign, as often as wee muſt pronounce judgment of morbifick cauſes. Wherfore to conclude, wee muſt think that opinion moſt certain concerning the matter of the diſeaſ, which is ſtrengthened with multiplicitie of ſigns, as thoſe which are drawn from the color of the part, the heat or coldneſs manifeſt to the touch, thoſe things that help and hurt, the patient's familiar and uſual diet, temper, age, region, ſeaſon of the yeer, proprietie of pain, the exacerbation or exceſs thereof, in what daies, and in what hours of the daie, the length of theſe fits, the urine and other excrements coming from the patient's bodie. But for that not a few are in that hereſie, that they think that wee muſt neither purge nor let blood in the Gout, weee muſt heer convince that opinion. For ſeeing that phyſick is the addition of that which want's, and the takeing of thoſe things that are ſuperfluous, and the Gout is a diſeaſ which hath its eſſence from the plentie of abounding humors, certainly, without the evacuation of them by purgeing and bleeding, wee cannot hope to cure, either it, or the pain which accompanie's it. *Metrius*, in his Treatiſe of the Gout write's, that it muſt bee cured by purgeing, uſed not onely in the declination, but alſo in the height of the diſeaſ, which wee have found true by experience; and it is conſonant to this ſaying of *Hippocrates*; in pains wee muſt purge by the ſtool. Beſides alſo, *Galen* profeſſeth that in great inflammations, fevers and pains, hee knew no greater nor ſurer remedie then to let blood, even to the fainting of the patient. If thoſe which are in this caſe ſhall not becom better by purgeing and phlebotomie conveniently preſcribed, then it happen's by the means of drunkenneſs, gluttonie, and the like diſtemper. For hence abundance of crude humors are heaped up, which by thir contumacie yeeld themſelvs leſs obedient to medicines. Therefore ſuch goutie perſons as are intemperate and giv'n to gluttonie and venerie, may hope for no health by uſe of medicines.

CHAP. XV.

Of local medicines which may bee uſed to a cold Gout.

It is not ſafe to uſe repercuſſives in the Gout before purgeing.

Little do topick medicines avail, unleſs the bodie of the goutie patient ſhall bee purged from excrementitious humors; beſides alſo there is danger leaſt by the uſe of repelling medicines, the virulencie of the humor may bee driv'n into the entrails, which thing hath been the cauſ of ſudden death to manie. Now in the firſt place wee will ſpeak of local medicines which are thought meet for a phlegmatick juice, becauſ this is more frequent, then that which is from a hot cauſ. At the begining in everie gout, the *Sciatica* excepted, wee muſt uſe aſtringent things which have a faculti to binde or ſtrengthen the joints, and to drie and waſte the excrementitious humor.

An aſtringent Cataplaſm.

As, R. *fol. ſabinæ* m. ß. *nucum cupreſſi* ℥iii. *aluminis roch.* ℥i. *gum. tragacanthæ* ℥iiii. *mucaginis pſilii & cydon. quantum ſufficit, fiat cataplaſma.* Or, R. *ſtercoris bubuli recentis* ℔. i. *mellis roſ.* ℥iiii. *olei roſ. & aceti an.* ℥ii. *bulliant ſimul parùm, fiat cataplaſma.* Or elſ, R. *olei roſar. & myrtill. an.* ℥ii. *pulveris myrrhæ & aloës an.* ℥i. *acaciæ* ℥ii. ß. *incorporentur cum aquâ gallarum coctarum, & fiat unguentum.* Som boil ſage, camomile and melilote flowers, wormwood and dane-wort, of each a handful in a ſufficient quantitie of vineger, then they put the grieved part into this decoction beeing warm; and by frequent uſeing this medicine, it hath been found to repel and conſume the noxious humor, not onely cold, but alſo cholerick; and alſo to ſtrengthen the part. The freſh *fæces* of Olives laid to the part, aſſwage pain: dried Oranges boiled in vineger, beaten and applied, do the ſame. Or, R. *medii corticis ulmi* ℔. ß. *caudæ equin. ſtœchad. conſolid. majoris, an.* m. ß. *aluminis roch. thuris an.* ℥iii. *farin. hordei* ℥v. *lixivii com. quantum ſufficit, fiat cataplaſma ad formam pultis ſatis liquidæ.* Commonly then when as the part ſwelleth up, the pain is leſſned, for that the expulſive facultie driveth the humor from the center into the circumference of the part, that is, from within outward; for in like ſort, ſuch as have the tooth-ache have leſs pain when their cheeks begin to ſwell.

A diſcuſſing fomentation.

One, partly aſtringent and partly diſcuſſing.

After repercuſſives, wee muſt com to thoſe which evacuate the conteined humor by evacuateing or reſolving it. For everie defluxion of humors remaining in anie part require's evacuation. Neither muſt wee marvel thereat, if the digeſted humor doth not vaniſh at the firſt time; for wee muſt have regard to the cold phlegm which is thick and viſcid, as alſo of the part which is ligamentous, membranous and nervous, and conſequently more denſ then fleſhie parts. R. *rad. Bryon. ſigilli beat. Mariæ. an.* ℥iv. *bulliant in lixivio, poſtea terantur, & colentur per ſetaceum, addendo farin. hordei & fabarum an.* ℥i. *olei chamæm.* ℥iii. *fiat cataplaſma.* Or, R. *hordei & lupin. ag.* ℥iii. *ſulphuris vivi & ſalis com. an.* ℥i. *mellis com.* ℥v. *pul aloës & myrrhæan.* ℥ß. *aq. vit.* ℥i. *cum lixivio, fiat cataplaſma.* Or, R. *ſucci calium rub. aceti boni, an.* ℥iiii. *farin. hordei* ℥iß. *pul. Hermodactyl.* ℥ß. *vitellos ovorum* nu. iii. *olei chamæm* ℥iii. *croci* ℈ii, ſom burn the roots and ſtalks of Coleworts, and mix the aſhes with hog's greaſ and the powder of Orris, and ſo

Why the goutie humor doth not preſently vaniſh upon the uſe of repercuſſives.

Greater diſcuſſes

so make a pultis. Or, R. *Lactis vaccini* lb.ii. *micæ panis albi quantum sufficit, bulliant simul, addendo pulveris subtilis florum chamæm. & meliloti an.* m.ß. *croci* ℈i. *vitellos ovorum* nu. iiii. *ol. ros.* ℥iii. *butyri recentis* ℥i. *terebinth.* ℥ii. *fiat cataplasma ad formam pultis satis liquidæ.* This Cataplasm may bee applied with good succes, not onely to phlegmatick and cold, but also to anie gout, at anie time to mitigate the extremitie of the pain in men of anie temper, and it must bee changed twice or thrice a daie. Also Triacle dissolved in wine, and anointed on the part, is said to asswage this pain. You may for the same purpose make and applie emplasterrs, unguents, cerats and linlutents: This may bee the form of an emplaster. R. *gummi ammoniaci, bdelii, styracis, an.* ℥ii. *cum aceto & aquâ vit. dissolve & adde farin. fænugr.* ℥ß. *olei chamæm. & aneth. an* ℥ii. *ceræ quantum sufficit, fiat emplastrum molle.* Or, R. *rad. bryon. sigill. beat Mariæ. an.* ℥v. *bulliant in lixivio completè, & colentur per setaceum, addendo olei cham.* ℥iiii. *sevi bircini* ℥iiii. *ceræ nov. quantum sufficit, fiat emplastrum molle.* Or, R. *gum. ammon. opopanacis galbani. an.* ℥ii. *dissolvantur in aceto, postea colentur, adde olei liliorum, terebinth. venet. an,* ℥i. *picis navalis, & cer. nov. quantum sufficit, fiat emplastrum molle.* Or elſ, R. *succi rad. enul. camp. & ebuli an.* ℥iii. *rad. althæ* lb. ß. *coquantur & colentur per setaceum, addendo florum cham. melil. sambuchi, rorismar. & hyperici an* p. ii. *nucum cupressi,* nu. iiii. *ol. cham. aneth. hyper. liliorum, de ficâ an* ℥ii. *pinguedinis anatis, gallin. anseris an.* ℥ß. *ranas viridas vivas* nu.vi. *catellos duos nuper natos, bulliant omnia simul, in* lb. ii. ß. *vini oderiferi & unâ aquæ vit. ad consumptionem succorum & vini, & ossium catellorum dissolutionem, & fortiter exprimantur; & expressionis adde terebinth.* ℥iii. *cer. quantum sufficit, fia emplastrum molle.* Also, *Emp. de vigo. Oxicroceum, de mucilaginibus, de meliloto* and the like mixed together, and softned with a little oil or *axungia*, are of the like facultie, and good for the same purpose.

A cataplasm good for anie Gout at anie time.

Discussing emplasters.

Let this bee the form of an ointment. R. *anserem pinguem, & imple catellis duobus, de quibus deme cutem, viscera, caput & pedes; item accipe ranas* nu. x. *volubros detracta cute in frustra dissectos* nu. iv. *mithridat. & theriac. an.* ℥ß. *fol. salviæ, rorismar. thymi, rutæ, an.* m. ß. *baccarum lauri, & juniperi, conquassat. an.* ℥i. *pulveris nuc. moschat. zinzib. caryophyl. & piper. an.* ℥i. *de eo quod stillabat fiat unguentum vel linimentum cum cerâ & terebinth. venetâ, paucâ aquâ vitæ additâ*; this marvelously asswageth the pain of the Gout arising from a cold caus. Another, R. *gummi pini, & lodani, an.* ℥iv. *gummi elemi & piscis naval. an.* ℥ß. *terebinth. venet. claræ* ℥vi. *chamæm. & liliorum an.* ℥vi. *vini rub.* lb. i. ß. *aq. vit. & salv. an.* ℥vi. *dissolvantur omnia simul lento igne, baculo semper agitando, deinde adde pul. ireos. flor. baccarum lauri et hermodactyl. an* ℥iiß. *masticbes, myrrhæ et olibani an.* ℥ii. *farinæ fabar.* ℥iv. *incorporentur omnia simul, fiat unguentum molle.* Or elſ, R. *nucag. seminis fænugr. in aceto extracti. quantum volueris, cui misce mellis quantum sufficit*; let them bee boiled together until they acquire the consistence of an ointment. These things shall bee changed, as often as need shall seem to require. Also an anodine and discussing fomentations are good to resolv; as this, R. *fol. rutæ, salv. rorismar. an.* m.i. *bulliant cum aceto & vino*; and so make a decoction for a fomentation, which you may use not onely in a cold Gout, but also in a hot, becaus it resolveth and strengtheneth the part by astriction, and free'th it from the defluxion: you must have a care that the medicines which are used to pains of the Gout bee changed now and then. For in this kinde of diseas that remedie which did good a little before, and now availeth, will in a short time becom hurtful.

Ointments.

Discussing fomentations.

Remedies must bee often changedin the gout.

But if the contumacie and exces of the pain bee so great, that it will not yeeld to the described medicines; then it is fit, becaus the diseas is extreme, to use (according to *Hippocrates*'s counsel) extreme, such as are those which follow. R. *axungiæ gallinæ, olei laurini masticb.* *euphorb. an.* ℥i. *pulv. euphorb. & pyreth an.* ℥i. *fiat litus*; herewith let the part bee rubbed everie daie, for it is a verie effectual medicine. For *euphorbium* and Pellitorie by their heat attenuate and resolv, the capon's greas and oil of baies relax, the oil of mastich strengtheneth the part and hindereth a new defluxion. Also there is made a verie anodine ointment of oil of Foxes, wherein earth-worms, the roots of elecampane and bryonie have been boiled, with a little turpentine and wax; this soften's, attenuate's and resolv's the cold humor impact in the joints. Or elſ R. *seminis sinapi pulverizati, & aceto acerrimo dissoluti,* ℥iii. *mellis anacardani* ℥ii. *aquæ vitæ* ℥i. *salis com.* ℥ii. let them bee all mixed together, and applied to the pained part. Or, R. *picis nigræ* ℥iii. *terebinth. venetæ* ℥i i. *sulphuris vivi subtiliter pulverisati* ℥iii. *olei quantum sufficit, liquefiant simul, fiat emplastrum*; let it bee spread upon lether, and laid upon the part for two or three daie's space, if the patient perceiv anie eas therby; if otherwise, let it bee changed as wee said before. Som for the same purpose applie nettles therto, and presently after wash the part in the sea or salt water. Others foment the part with vineger wherin pigeons hath been boiled. A vesicatorie made of verie sower leaven, *cantharides*, and a little *aqua vitæ* is verie powerful to evcauate the conjunct matter. For thus the malign and virulent *serum*, or whayish humor is let out, whence follow's som eas of the pain. Now there are som goutie pains, which cannot bee lessned or asswaged unles by remedies more powerful then the distemper, therfore vesicatories ought not to bee rejected, seeing that the Ancients in this affect have also made use of actual cauteries, as wee shall shew heerafter. *Christopher Andreas* in his book termed *Oecoitarie* [that is, domestick physick] much commend's Ox-dung wrapped in cabbage or vine-leavs, and roasted in the embers, and so applied hot too the grieved part.

A great discusser.

An anodine.

A vesicatorie against the contumacie of the conjunct matter.

CHAP.

CHAP. XVI.

Of local medicines to bee applied to hot or ſanguin Gout.

What repercuſſives are here required.

HEre muſt wee in the begining make uſe of repercuſſives, ſuch as are cold and drie, that they may contend with the morbifick matter by both their qualities; alſo let them bee aſtrictive, ſo to add ſtrength to the part. But I would have you alwaies to underſtand that you muſt firſt premiſe general medicines. R. *albuminum ovorum* nu. iv. *ſucci lactucæ & ſolani an.* ʒi. *aq. roſar.* ʒii. *incorporentur ſimul, & fiat linimentum ſæpius renovandum.* Others take the meal of barlie, lentils, *acatia*, oil of roſes, myrtles, and with a little vineger they make a cataplaſm; Or, R. *ſumach. myrtillorum, boli arm. an.* ʒß. *acatiæ, corticum granat. baluſt. an.* ʒi. *aq. plantag. & roſar. an.* ʒiii. *ol. roſati* ʒiiß. *aceti* ʒii. *farinæ hordei & lentium quantum ſatis erit, fiat cataplaſma.* This is verie excellent and effectual to ſtay or hinder phlegmonous and eriſipelatous tumors. Alſo you may make a cataplaſm *ex mucagine Cydoniorum in aquâ roſarum extractâ, caſiæ fiſtulâ, oleo roſato, & aceto:* Or, R. *pampinorum vitis viridum*, m.ii, *terantur & bulliant in oxycrato ex aquâ fabrorum, cui adde ſumach. conquaſſat.* ʒi. *olei roſat.* ʒii. *farinæ hordei quantum ſufficit, fiat cataplaſma.* Or elſ, R. *ſucci ſempervivi, hyoſcyami, portulacæ an.* ʒiv. *corticum mali granati* ʒiiß *farinæ hordei* ʒv. *vini auſteri quantum ſufficit, fiat cataplaſma*; this is much commended, for it hath entring thereinto wine and the pomgranate pill, which both are verie great aſtrictives; and the juices are exceeding cooling, the meal alſo hinder's and thicken's the ſanguin humors that are readie to flow down, and make the medicine of a good conſiſtence. Another: R. *fol. hyoſcyami & acetoſæ an.* m.i. *involvantur papyro, & ſub cineribus coquantur, mox cum unguento populeon. aut roſat.* ʒii. *incorporentur*; and then lay this Cataplaſm thus made warm unto the part. Another: R. *florum hyoſciami* ℔.ii. *ponantur in phialâ vitreatâ, & reconde in fimo equino donec putruerint, accipe ex putredine* ʒii. *in quibus diſſolve olei de junipero* ʒß. *fiat linimentum ad uſum.* Others beat pulp of a Gourd or Citrul in a mortar, and ſo applie it. Another: R. *mucag. ſem. pſilii, & cyton. exteact. in aq. roſat. & ſolani an.* ʒiiii. *olei roſati omphacini* ʒiii. *vinî granat.* ʒi. *vitellos ovo. cum albumine* nu. iii. *camphoræ* ʒi. *encorporentur ſimul, fiat linimentum.* Or elſ, R. *ol. roſat. omphacini* ʒiv. *album. ovorum cum vitellis* nu.vi. *ſucci plantag. et ſolani an.* ʒi. *farinæ hordei* ʒiii. *incorporentur ſimul, fiat cataplaſma.* Or, R. *farinæ fabarum et hordei an.* ʒiii. *olei roſati*, ʒii. *oxycrati quantum ſufficit, coquantur ſimul, fiat cataplaſma.* Another; R. *mucag. ſem. pſilii* ʒiiii. *ol. roſati* ʒii. *acet* ʒi *vitellos ovorum*, nu. iii. *croci* ℈i. *miſce.* *Plinie* reporteth that *Sextus Pomponius* the Governor of the hither-Spain, as hee overlooked the winowing of his corn, was taken by the pain of the Gout in his feet, wherfore hee cover'd himſelf with the Wheat above his knees, and ſo was eaſed, his feet beeing wonderfully dried; and hee afterwards uſed this kinde of remedie. It is note-worthie, which often happeneth, that the pain cannot bee altogether eaſed by ſuch remedies, by reaſon of the abundance of blood impact in the part; wherefore it muſt bee evacuated: which I have don in manie with good ſucceſs, opening the vein which was moſt ſwelled and nigh to the affected part; for the pain was preſently aſſwaged. Neither muſt wee too long make uſe of repercuſſives; leaſt the matter becom ſo hardned, that it can ſcarce bee afterwards reſolved, as when it ſhall bee concrete into knots and plaſter-like ſtones: reſolving medicines are to bee mixed with repercuſſives conveniently applied, ſo to diſcuſs the humor remaining as yet in the part, whereof ſhall bee ſpoken in the following Chapter.

An excellent aſtringent cataplaſm.

Lib.22.cap.25.

Phlebotomie to evacuate the conjunct matter, and aſſwage pain.

CHAP. XVII.

Of local medicines for a cholerick Gout.

What repercuſſives are heer required.

THe repercuſſives that muſt firſt bee uſed in this kinde of Gout ought to bee cold and moiſt, that ſo they may reſiſt both the qualities of choler; ſuch are the leavs of night-ſhade, purſlain, houſ-leek, henbane, ſorrel, plantain, poppie, cold water and the like, whereof may bee made diverſ compoſitions. As, R. *ſucci hyoſcyami, ſempervivi, lactuc. an.* ʒii. *farin. hordei* ʒi. *olei roſati* ʒii. *agitando ſimul fiat medicamentum*; let it bee applied and often changed, for ſo at length it will aſſwage the inflammation. Som think the brain of a hog mixed with white ſtarch, or barlie-meal and oil of roſes, an excellent medicine. The leavs of mallows boiled in water, and beaten with a peſtil, and applied, aſſwage pain. R. *mucag. ſem. pſilii extract. in aq ſolani, vel roſarum* ʒii. *farin. hordei* ʒi. *aceti q. ſ. fiat linimentum.* Or elſ, R. *unguent. roſat. meſnæ & populei an* ʒiii. *ſucci melonum* ʒii. *alb. ovorum*, nu.iii. *miſceantur ſimul pro litu.* Alſo a ſponge dipped in oxycrate, and preſſed out again and applied thereto doth the ſame. Or elſ, R. *fol, caulium rub.* m. ii. *coquantur in oxycrato & terantur: adde ovorum vitellos tres, olei roſati* ʒiii. *farinæ hordei quantum ſufficit, fingatur cataplaſma.* Alſo you may take the crude juice of cole-worts, dane-weed, and roſes beaten and preſſed out, and of theſe incorporated with oil of roſes and barlie-meal make a cataplaſm. In winter-time, when as theſe things cannot bee had green, you may uſe

unguent.

unguentum infrigidans Galeni & populeon. Or elſ, R. *ceræ albæ* ℥i. *croci* ℈i. *opii* ℈iiii. *olei roſati quantum ſufficit, marcerentur opium & crocus in aceto, deinde terantur et incorporentur cum cerâ et oleo, fiat ceratum*; ſpread it upon a cloth, and lay it upon the part, and all about it, and let it bee often renewed. Som cut Frogs open and applie them to the grieved part. It is confirmed by ſundrie men's experience, that pain of the *Sciatica*, when it would yeeld to no other remedie, to have been aſſwaged by anointing the affected with the mucous water or gellie of Snails, beeing uſed for the ſpace of ſeven or eight daies; the truth whereof was aſſured mee by the worthie Gentleman the Lord of *Longemaux*, a man of great honeſtie and credit, who himſelf was troubled for ſix month's ſpace with the *Sciatica*. This water is thus made, Take fiftie or ſixtie red Snails, put them in a copper-pot or kettle, and ſprinkle them over with common ſalt, and keep them ſo for the ſpace of a daie; then preſs them in a courſ or hair-cloth; in the expreſſed liquor dip linnen rags and applie them ſo dipped to the part affected, and renew them often. But if there bee great inflammation, the Snails ſhall bee boiled in Vineger and Roſe-water. They ſay that Citrons or Oranges boiled in Vineger, and beaten in a mortar, and incorporated with a little barlie or bean flower, are good againſt theſe pains. Or elſ, R. *pomorum cottorum in lacte* ℔i. *butyri* ℥i. *vitellos ovorum*, nu. ii. *aceti* ℥i. *fiat cataplaſma*. There are ſom who take cheeſ-curd newly made, and mix it in a mortar with oil of Roſes and barlie-meal, and ſo applie it; it repreſſeth inflammation and aſſwageth pain. Others mix *caſſia* newly extracted forth of the cane, with the juice of Gourds or Melons. Others applie to the part the leavs of Coleworts, and Dane-weed or ſmallage, or all three mixed together and beaten with a little Vineger. Others macerate or ſteep an ounce of linſeed in Wurt, and make the mucilage extracted therefrom into a Cataplaſm with ſom oil of Roſes and barlie-meal. Som put oil of poppies to the pulp of Citrulls or Gourds beeing beaten, and ſo incorporate them together, and applie it.

A cerate with *opium*.

The water of Snails.

This following medicine hath its credit from a certain Gaſcoin of Baſas that was throughly cured therewith, when as hee had been vexed long and much with goutie pains, above the common cuſtom of ſuch as are troubled with that diſeaſ. Thus it is; Take a great ridg-tile thick and ſtrong, and heat it red hot in the fire, then put it into ſuch another tile of the ſame bigneſs, but cold, leaſt it ſhould burn the bed-clothes, then forthwith fill the hot one with ſo manie Dane-wurt-leavs, that the patient may ſafely lay the affected part therein without anie danger of burning it. Then let the patient endure the heat that com's therefrom, and by ſweat receiv the fruit thereof, for the ſpace of an hour, ſubſtituteing freſh Dane-wurt-leavs, if the former becom too drie, as alſo another hot tile, if the former ſhall grow too cold before the hour bee ended. This beeing don, let the part bee dried with warm and drie linnen clothes. Uſe this particular ſtove for the ſpace of fifteen daies, and that in the morning faſting; afterward annoint the part with this following ointment. R. *ſucci ebuli* ℔ i. ℈. *olei com.* ℔ i. *miſceantur ſimul*, and let them bee put into a ſtrait mouthed glaſs, and well luted up; then let it boil in *balneo Mariæ*, beeing firſt mixed with ſom wine, untill the half thereof bee conſumed, for the ſpace of ten or twelv hours, then let it cool, and ſo keep for uſe, adding thereto in the time of anointing, ſom few drops of *aqua vitæ*. It may bee anointed twice or thrice in a daie, long after meat. Moreover, the roots and leavs of Dane-wurt boiled in water, beaten and applied aſſwage pain; the oil thereof chimically extracted perform's the ſame.

An hiſtorie.

A particular ſtove.

An ointment of the juice of Dane-wurt.

But if the contumacious pain cannot bee mitigated by the deſcribed remedies, and becoming intolerably hot and rageing, make the patient almoſt to ſwoun, then muſt wee flie to Narcoticks. For although the temper of the part may bee weakned by theſe, the native heat diminiſhed or rather extinguiſhed; yet this is a far leſs inconvenience then to let the whole bodie bee waſted by pain. Theſe things have a powerful refrigerateing and drying facultie, takeing away the ſenſ of the pain, and furthermore, incraſſate, thin acrid and biteing humors, ſuch as cholerick humors are. Wherefore if the matter which cauſſeth the pain bee thick, wee muſt abſtain from Narcoticks, or certainly uſe them with great caution. R. *micæ panis ſecalini parùm cocti in lacte*, ℥ii. *vitellos ovorum*, nu. ii. *opii* ℥i. *ſuccorum ſalani, byoſcyami, mandragoræ, portulacæ, ſempervivi, an.* ℥i. let them bee mixed together and applied, and often changed. Or elſ, R. *fol. byoſcyami cicutæ, acetoſ. an.* m. i. *bulliant in oxycrato & contundantur, cinque vitellis ovorum crudorum* nu. ii. *& olei roſat.* ℥ii. *farin. hordei quod ſatis ſit, incorporentur, fiat cataplaſma*; with the uſe thereof I am accuſtomed to aſſwage great pains. Or elſ, R. *opii* ℥iii. *camphor.* ℈ſ. *olet nenupb.* ℥i. *lactis* ℥ii. *unguent. roſ. Galeni* ℥iv. *incorporentur ſimul in mortario, applicentur*. Moreover, cold water applied and dropped upon the part drop by drop, is narcotick and ſtupefactive, as *Hippocrates* affirmeth, *Aphor. 29. Sect. 5.* for a moderate numneſs mitigateth pain. There is alſo another reaſon why it may bee profitably uſed in all pains of the Gout, for that by repelling the humors, it hindereth their defluxion into the part. Mandrag-apples boiled in milk, and beaten, do the ſame thing; alſo the leavs of henbane, hemlock, lettuce, purſlain, beeing ſo boiled, do the ſame. If anie deſire to uſe theſe more cold, hee muſt applie them crude, and not boiled.

When to uſe narcoticks.

A cataplaſm with *opium*.

But the exceſs of pain beeing mitigated, wee muſt deſiſt from the uſe of ſuch narcoticks, and they muſt rather bee ſtrengthened with hot and digerateing things; otherwiſe there will

How to amend the harm don by Narcoticks.

will bee danger leſt it bee too much weakned, the temper thereof beeing deſtroied, and ſo afterwards it may bee ſubject to everie kinde of defluxion. Wherefore it ſhall bee ſtrengthe ned with the formerly diſcuſſing fomentations, and theſe enſuing remedies. As, Rx. *gum. ammoniaci & bdelii an,* ℥i. *diſſolvantur in aceto, & paſſentur per ſetaceum, addendo ſtyracis liquid. & farin. fænugr. an.* ℥ß. *pulv. ireos* ℥iiii. *olei chamæm.* ℥ii. *pulveris pyrethri* ʒii. *cum cerâ, fiat emplaſtrum molle.* Or, elſ, Rx. *rad. emulæ, ebuli altheæ an.* lb. ß. *ſem. lini, fænugr. an.* ʒii. *ficuum ping.* nu. xx. *coquantur completè & trajiciantur per ſetaceum, addendo pul. euphorb.* ʒii. *olei chamæm. aneth. & rutacei, an.* ℥iii. *medullæ cervi* ℥iv. *fiat cataplaſma.* Yet you muſt uſe moderation in diſcuſſing, leſt the ſubtler part of the impact humor beeing diſcuſſed, the groſſer part may turn into a ſtonie conſiſtence, which alſo is to bee feared in uſeing repercuſſives.

Diſcuſſers.

A mean to bee uſed in diſcuſſing.

Barbes aſſwage the pain of the Gout.

I alſo omitted, that according to the opinion of the Antients, bathes of freſh water, wherein cooling herbs have been boiled, uſed three hours after meat, conduce much to the aſſwageing of pain; for ſo uſed, they are more convenient in cholerick natures, and ſpare bodies, for that they humect the more, and quickly digeſt the thin and cholerick, and conſequently acrid vapors, the pores beeing opened, and the humors diſſipated by the gentle warmneſs of the bath. After the bath, the bodie muſt bee anointed with *hydrælium*, or oil and water tempered together, leſt the native heat exhale and the bodie becom more weak. Meats of more groſs juice are more convenient, as beef, ſheeps-feet, and the like, if ſo bee that the patient can digeſt them, for theſe inſpiſſate the cholerick blood, and make it more unfit for defluxion.

How meats of groſs juice are profitable.

CHAP. XVIII.

What remedies muſt bee uſed in pains of the joints proceeding of a diſtemper onely, without matter.

An hiſtorie.

PAins alſo happen in the joints by diſtemper without anie matter, which though rare, yet becauſ I happened once to feel them, I have thought good to ſhew what remedies I uſed againſt them. I once earneſtly buſied in ſtudie, and therefore not ſenſible of ſuch external injuries as might befall mee; a little winde coming ſecretly in by the crannies of my ſtudie, fell upon my left Hip; at length wearied with ſtudie, aſſoon as I roſe up to go my way, I could not ſtand upon my feet, I felt ſuch bitter pain without anie ſwelling or humor which might bee diſcerned. Therefore I was forced to go to bed, and calling to minde, that cold, which was abſolutely hurtful to the nervs, had bred mee that pain, I attempted to drive it away by the frequent application of verie hot clothes; which, though they ſcorched and bliſtered the ſound parts adjoining thereto, yet did they ſcarce make anie impreſſion upon the part where the pain was ſettled, the diſtemper was ſo great, and ſo firmly fixed therein. And I laied thereto bags filled with fried oats and millet, and dipped in hot red wine; as alſo ox-bladders half filled with a decoction of hot herbs. And laſtly, a wooden diſh almoſt filled with hot aſhes, covered over with ſage, roſmarie and rue lightly bruiſed, and ſo covered with a cloth, which, ſprinkled over with *aqua vitæ*, ſent forth a vapor which aſſwaged the pain. Alſo brown bread newly drawn out of the oven, and ſprinkled over with roſe-water, and applied, did verie much good. And that I might more fully expel this hurtful cold, I put ſtone-bottles filled with hot water, to the ſoals of my feet, that the brain might bee heated by the ſtraightneſs and continuitie of the nervs. At length, by the help of theſe remedies, I was verie well free'd from this contumacious diſtemper, when it had held mee for the ſpace of four and twentie hours.

Hip. ap. 10. ſect. Divers remedies for pain ariſeing from a cold diſtemper without matter.

A fuliginous vapor ſometimes the cauſ of the Gout.

There is another kinde of Goutie pain ſomtimes cauſed by a certain excrementitious matter, but ſo thin and ſubtle that it cannot bee diſcerned by the eies. It is a certain fuliginous or ſootie vapor, like to that which paſſeth from burning candles or lamps, which adhere's and concrete's to anie thing that is oppoſed thereto; which beeing infected by the mixture of a virulent ſerous humor whitherſoever it runneth, cauſeth extreme pain, ſomwhiles in theſe, and otherwhiles in other joints, unleſs you make a way therefore, when as it ſeeketh paſſage forth, wich muſt bee don by horns, cupping-glaſſes, veſicatories, cauteries, or other the like art.

CHAP. XIX.

What is to bee don after the fit of Gout is over.

How to ſtrengthen the joints.

IT is convenient when the pain is aſſwag'd, that you ſtrengthen the joints. Now, to ſtrengthen them is not onely to binde and drie, but wholly to amend the weakneſs left in the part by the diſeaſ, that is to diſcuſs the humor, if anie ſuperfluitie thereof remain; but to humect the part, if the moiſture bee exhauſted and dried up. But ſuch as are troubled with the gout, after they are free'd from their pain, have notwithſtanding ſuch impotencie of their joints that they cannot go of a long time after; for that the nervs and tendons

Remedies for the weakneſs left in the joints after the pain is gon.

tendons which are in great number in the feet, beeing moiſtned with much phlegm, are ſo relaxed, that they can no more ſuſtain or bear themſelvs upon their feet, then paper when it is wet can bee made to ſtand. Wherefore, that they may recover the uſe of their feet, the impacted humor muſt by all means bee diſcuſſed, and ſpent with fomentations, cataplaſms, drying and aſtringent emplaſters. You may uſe the formerly deſcribed fomentation, encreaſing the quaintitie of alum and ſalt, and adding thereto a like quantitie of *ſulphur vivum*: then the following emplaſter ſhall bee applied thereto. R. *maſ. emplaſt. contra rupturam* ℥iiii. *tereb.* ℥ii. *pulv.roſ.rub. nucum cupreſſ.gallarum, gran myrtil. & fol.ejuſdem, thuris, maſtich. & caryophyl.an.* ℥i. *malaxentur omnia ſimul, manibus inunctis oleo myrtino & maſtichino, fiat emplaſtrum.* Let it bee ſpread upon leather to a juſt bigneſs, and applied to the top and ſole of the foot. Draw over the plaſter, and the whole leg a ſtocking made of a tanned-dog's-skin; this emplaſter ſtrengtheneth the nervs, draweth forth the humor impact therein, and intercept's the defluxion. But the dog-skin-ſtocking preſerveth the native heat of the part, and for that it bindeth, hindreth the defluxion into the feet.

The benefit of a dog-skin ſtocking.

CHAP. XX.

Of the Tophi, *or knots which grow at the joints of ſuch as are troubled with the Gout.*

Whence the *Tophi* are generated.

SOm that are troubled with the Gout, have knottie bunches growing in their joints, which by the antients were called *Tophi*. Theſe are generated by the congeſtion of groſs, viſcid and crude phlegm, with a little admixtion of an acrid and cholerick humor. Theſe matters remain ſettled in the part, for that it beeing too weak cannot digeſt and depreſs them; wherefore beeing there impact, they eaſily concrete into a certain plaſter-like or chalk-like ſubſtance, whileſt by the adventitious and burning heat cauſſed by pain, and the goutie malignitie, their more ſubtle part is diſperſed, but the groſſer ſubſide's. Yet ſomtimes the unfit application of repercuſſive or diſcuſſive medicines is a cauſ of the generation of theſe *Tophi*. For by the former, the impact matter is incraſſated and gathered together; but by the later, the ſubtle part beeing diſcuſſed, the remnant that ſubſide's, concrete's into *Tophi*. Thoſe medicines which are made to mollifie, ought to have a moderately heating, and humecting facultie, that they may diffuſe, and as it were diſſolv the impact matter; ſuch is warm water, the decoction of emollient herbs, the decoction of calv's or ſheep's entrails, heads and feet: after theſe or the like fomentations, you ſhall uſe the following medicine. R. *axungiæ, human. anſeris & gallinæ, medul. cervin. an.* ℥ii. *tereb.ven.* ℥i. *aq.vitæ parum, ceræ quantum ſufficit, fiat unguentum molle.* Then this which followeth will bee good. R. *rad. altb. liliorum, bryon. lapath. acuti, an.* ℥iiii. *coquantur completè, & trajiciantur per ſetaceum; adde gum. ammon. bdel. galb. opopanacis in aceto diſſolutorum* ℥i. *medul.cervin.* ℥iſs. *incorporentur ſimul, & applicentur.* Or elſ, R. *olei liliorum, amygd.dul.medullæ cruris cer.an.* ℥iiſs. *mucag.ſem.lini, altb.ſarcocol. an.* ℥i. *ceræ quantum ſufficit; fiat ceratum.* Or elſ, R. *empl.de vigo cum mercurio, & cerat.de æſipo humidâ deſcript. Philagrii, an.* ℥ii. *malaxentur ſimul cum oleo lilior. fiat maſſa.* Or elſ, R. *gum.ammon. opopan. galb. bdel. diſſolutorum in aceto, an.* ℥ii. *panno lineo colatis, adde pulv. ſulph. nitr. ſinapi, pyrethri, an.* ℥ſs. *ſtyracis, liq & axung. hum.an.* ℥i. *reſpini, tereb.ven.an.* ℥ſs. *ceræ quantum ſufficit, fiat ceratum molle.* This which follow's is thought moſt effectual in the opinion of *Galen* and *Avicen*. R. *pedes porcel.bene ſalſos, nu.*iiii. *veterem pernam, cum illis coque: addendo ſub finem, radicis bryoniæ, lapath.acut. an.* ℥iii. *axungiæ tauri, & medul. cervin.an.* ℥i. *cum caſeo putrefacto fiat empl.molle ad uſum.* This which follow's is alſo moſt effectual. R. *caſei acris & putrefacti,* ℥iiii. *pulv.ſulph.vivi euphorb.& pyreth.an.* ℥iii. *decoctionis veteris pernæ & porcellorum quod ſufficit ad incorporandum, ducantur in mortario, & fiat empl.ad uſum.* Or elſ, R. *ſpumæ nitri,* ℥vi. *tereb.* ℥ii. *olei veteris, lixivii, quo lanæ pileorum lavantur, & ceræ quantum ſufficit, fiat ceratum ſatis molle.* After the uſe of emollients, a fumigation ſhall bee made in this manner: Heat a cogle-ſtone, mill-ſtone or brick red hot in the fire, take it forth, and caſt upon it a ſufficient quantitie of verie ſharp vineger, and *aqua vitæ*, the riſing vapor ſhall bee diligently received by the affected member, for this hath a facultie to attenuate and cut groſs, viſcid, and plaſter-like matter, yea alſo, and to break the skin; yet that is broken oftime of its own accord, without the help of either medicine or inſtrument. To conclude, theſe medicines which are good to mollifie ſcirrhous tumors, the ſame are alſo good to ſoften the goutie knots and *topbi*. But wee muſt note, that theſe knottie bunches are ſomtimes ſuppurated, not truly by the impact and plaſter-like matter, but by a new defluxion comming on a ſudden, and then it is neceſſarie to make way for the contained matter, which beeing don, firſt there commeth forth an humor like milk, then a plaſter-like matter, then it leav's behinde it an ulcer to bee cured by applying thereto *empl.gratiâ Dei*, and others as the Surgeon ſhall think fit.

Unfit application of diſcuſſive and repercuſſive medicines cauſe the *Tophi*.

Mollifying medicines.

*Lib.*10. *ſimp. c.*7. *ſect.*22. *lib.*3. *pract.c.*6. *c.*21.

An effectual fumigation.

CHAP. XXI.

Of Flatulencies contained in the joints, and counterfeiting true Gouts, and of the remedies to bee uſed thereto.

In what joints flatulencies are chiefly generated.

Oftimes there is ſmall quantitie of humor, which move's the pain of the Gout; but much flatulencie mixed therewith, eſpecially in great joints, as in the huckle or hip-bone, and the knees; they ſomtimes cauſ ſo great diſtention, that they drive the heads of the bones forth of their places. You may partly underſtand it is ſo, if a tenſive pain afflict the patient with anie ſenſ of heavineſs; if when you preſs the tumor with your fingers, the place retain no mark or impreſſion thereof, as happen's in an *ædema*: but on the contrarie, a flatulent ſpirit lift's it up as it were by renitencie, as if one ſhould thruſt a pair of bellows, which are filled with winde; hence the part cannot perform its dutie, for that the ſpaces of the joints are poſſeſſed with abundance of flatulencies, ſo that the libertie of motion is intercepted, and the member is kept as it were bound up. Manie no verie skilful Surgeons, putting their fingers to theſe kinde of tumors, ſo that lifting up the one, they preſs down the other, when as they perceive the flatulencie, as it were, riſing between their fingers, ſuppoſing it to bee the motion of *pus*, or matter alreadie generated & flowing up and down, as is uſual in impoſtumes, they have opened it by inciſion; but when as nothing flowed forth, it appeared how much they were deceived, yet in the *interim*, by this their raſhneſs they have cauſſed manie dangerous ſymptoms: as increaſ of pain, deſluxion of humors, by force whereof the bones have been diſlocated, and brought to the patient an uncureable lameneſs. But theſe flatulent Gouts are ſeldom without ſom phlegmatick matter, which is neither too crude, nor viſcid. Such like flatulencies are not eaſily diſcuſſed, nor at the firſt endeavor, by reaſon of a cold diſtemper which they bring to the part, and the denſitie of the membranes and ligaments, by which the articulation is knit and faſtened, ſo that ſcarce anie part of that which is there ſhut up can breathe forth of ſuch ſtraight paſſages. Therefore the cure muſt bee undertaken with reſolving, diſcuſſing, and drying fomentations; as for example, with a decoction of fennel, aniſ-ſeeds, rue, chamomil, melilote, ſage, roſemarie, *origanum*, calamints, hore-hound, and the like, boiled in wine with a little lee, roſe-vineger, and common ſalt. This following ointment ſhall bee uſed after the fomentation. ℞. *olei chamæm. aneth. rut. lauri, an.* ℥ii. *cum cerâ albâ, fiat linimentum, addendo aq. vitæ parum.* After you have annointed it, applie thereto this following cataplaſm. ℞. *flor. cham. melil. aneth. roſ. rub. pulv. an.* m. i. *fol malv. & abſinth. an.* m. ß. *fiat ſur*, m i. *bulliant omnia ſimul cum lixivio, & vino rubro, deinde piſtentur cum medullâ panis, & farinâ fabarum, quantum ſufficit, fiat cataplaſma, addendo ol. roſar. & myrtin. an.* ℥ii. Som highly approov of this following medicine for the watteing of flatulencies. ℞. *axung. ſuil.* ℥iv. *calcis vivæ,* ℥iß. *terantur diligenter in mortario, & incorporata applicentur.* Or elſ, ℞. *ſtercor. caprar. cocti cum vino & aceto, an.* ℞ß. *tereb. venet. & mel. com. an.* ℥ii. *aq. vitæ,* ℥ß. *pul. rad. Ireos florent. & ſabin. an.* ℥iii. *olei rut. & aneth. an.* ℥i. *farin. fabarum quantum ſufficit.* Make a cataplaſm to the form of a pultis. Alſo ſtoups dipped in oxycrate, and wrung out, ſhall bee applied: in this oxycrate ſhall bee boiled wormwood, *origanum*, chamomil, melilote, rue, common ſalt, adding thereto ſom *aqua vitæ*. Then the part ſhall bee bound up as ſtraight as the patient can endure it; in concluſion, that the native ſtrength may by little and little bee reſtored to the part, it ſhall bee fomented with lee made of the aſhes of oak-wood, and the cuttings of vines, wherein ſhall bee boiled ſalt, ſulphur, choice alum, and wetting linnen-clothes, or ſtoups therein, and applying them, it ſhall bee ſtraightly ſwathed up. Yet if great pain ſhall more cruelly vex the part, then neglecting for a time the proper cure of the diſeaſ, you ſhall withſtand the ſymptom by rubbing the part, and annointing it with ſom diſcuſſing oil, laying thereon ſom moiſt wooll, and other anodyne things.

How flatulencies may make you believ there is *pus*, or matter.

Why hard to cure.

CHAP. XXII.

Of the Iſchias, *Hip-gout*, or Sciatica.

Why it hath the moſt grievous ſymptoms.

For that the Hip-gout in the greatneſs of the cauſſes, bitterneſs of pain, and vehemencie of other ſymptoms, eaſily exceed's the other kindes of Gout, therefore I have thought good to treat thereof in particular. The pain of the *Sciatica* is therefore the moſt bitter, and the ſymptoms moſt violent, for that the dearticulation of the huckle-bone, with the head of the thigh-bone, is more deep then the reſt; becauſ alſo the phlegmatick humor which cauſſeth it, is commonly more plenteous, cold, groſs, and viſcid, that flow's down into this joint: and laſtly, becauſ the *Sciatica* commonly ſucceed's ſom other chronical diſeaſ, by reaſon of the tranſlation and falling down thither of the matter, becom malign and corrupt by the long continuance of the former diſeaſ. But the pain not onely trouble's the hip, but entring deep, is extended to the muſcles of the buttocks, the groins, knees, and verie ends of the toes, yea often times it

The cauſ of the large ſpreading of the pain.

vexeth

vexeth the patient with a ſenſ of pain in the verie *vertebra* of the loins, ſo that it make's the patients, and alſo oftimes the verie Phyſicians and Surgeons to think it the winde or ſtone-colick. The cauſe of ſuch wandering and diſperſed pain is to bee referred to the manifold diſtribution of the nervs which com to that joint from the loins and *holie-bone*, for they are ſent into the muſcles of the buttocks, and ſo diſperſed over the whole leg to the verie ends of the toes, as it is ſhewed in our Anatomie. Therefore the pain is largely extended, that is, to what part ſoever a nerv run's which com's from the affected hip. Often times there is no ſwelling, no redneſs, nor diſtemper manifeſt to the eie, by reaſon that the veins are verie few which riſe into the ſurface and skin of this part, and the humor lies, as it were, ſunk in; which is the cauſ that diverſ times the excrementitious humors mixed with flatulencie, run ſo violently into the cavitie of this joint, that relaxing the ligaments, as well proper as common, the head of the thigh-bone is eaſily driven out from hence, ſo that it may never bee reſtored again, if it remain ſo for anie ſpace of time; for that in this time the humor falling down into this cavitie, by delaie concrete's as it were into a ſtonie bodie, and the head of the thigh-bone wear's it ſelf another cavitie in the neighboring bone; but the lips of the true cavitie, which are griſtlie, becom more ſtraight and depreſt: and laſtly, all the ligamentous bodies moiſtned with this excrementitious humor becom more looſ and weak, whence ſucceed manie and moſt grievous ſymptoms; as lameneſs, and the decaie not onely of the thigh and leg, but at length of the whole bodie; and laſtly, a ſlow and hectick fever, which in continuance of time will conſume the patient for the cauſſes formerly mentioned. Therefore let Phyſicians and Surgeons have a care that they reſiſt it at the firſt, and, with ſuch powerful remedies as are mentioned in the following Chapter, hinder the ſpringing up and growth of the formerly mentioned ſymptoms.

The thigh-bone often diſlocated by the *Sciatica*.

CHAP. XXIII.

The cure of the Sciatica.

THough the *Sciatica* bee commonly occaſioned by tough phlegm, yet if the patient bee ſtrong, and abound with blood, and all things elſ conſent, it ſhall bee good to draw blood by opening a vein; for phlebotomie equally evacuate's all humors: therefore the falling down of the humors into the part affected, is thereby hindered or retarded. Verily, I have known no ſpeedier remedie to aſſwage the pain of inflammation, then blood-letting, beeing firſt made on the *Baſilica* of the grieved ſide for revulſion's ſake; and then for evacuation of the conjunct matter on the *vena Iſchiadica*, which is at the out-ſide of the ankle, if the pain of the *Sciatica* bee more on the out-ſide; or elſ on the *Sapheia*, which is on the in-ſide of the ankle, if the inner parts bee more pained. The quantitie of blood which is to bee drawn, muſt bee left to the judgment of the Phyſician, without whoſe advice I would attempt nothing in this caſe. Alſo acrid glyſters are good, if there bee nothing which may hinder; as ulcers of the guts, or hemorrhoids. R. *rad.acor.* ℥ii. *centaur.rut, ſalv.roriſm.calam.origan.puleg.an.*m.ß. *ſtœchad.arabic.flo.cham.melil.aneth.an* p.i. *ſem.aniſ. & fœnic.an.* ℥ß. *fiat decoctio ad* lbi. *in colaturâ diſſolve bierœ & diaphen.an.* ℥ß. *mellis anthoſ.ſacc. rub. an.* ℥i. *olei liliorum* ℥iii. *fiat clyſter.* Strong purgations are alſo here uſefull, as of *pillul.fœtid.arthritic. Aſſajereth.de Hermodactylis*, and others uſed in phlegmatick cauſſes. *Electuarium Diacarthami* purgeth choler and phlegm. Often vomitings do not onely evacuate the humors, but alſo make revulſion, as wee have formerly delivered. Baths & ſweats profit no otherwiſe then a decoction of *Guaicum* or *ſarſaparilla*. If heat moleſt the part, then foment it with oil of roſes and vineger, eſpecially if the pain bee deep in, for vineger by its tenuitie pierceth to the bottom, and make's way for the oil, which of its own nature is anodyne. After the uſe of general medicines, you ſhall applie attractive and reſolving things: emplaſters of pitch and ſulphur, or of *ammoniacum, exphorbium, terebinthina, propolis, galbanum, bdelium, Opopanax*, draw the humor from within to the ſurface or skin. As in like ſort alſo the chymical oil of ſage, roſemarie, pellitorie of Spain, and ſuch other like do the ſame, which by reaſon of the tenuitie of their ſubſtance, and their ſeparation from earthie impuritie, have far more powerful and expedite faculties to penetrate and diſcuſs. Yet muſt you uſe none of all theſe without verie good judgment and deliberation, otherwiſe there will bee danger of inflammation.

Why wee muſt open a vein in the *Sciatica*.

When the vena *Iſchiadica* and *Sapheia* muſt bee opened in the *Sciatica*.

Strong purgations in the *Sciatica*.

There may alſo bee made fomentations of diſcuſſing and reſolving herbs, as the roots and leavs of dane-weeds, orris, bay and juniper-berries, the ſeeds of fenugreek, aniſ, fennel, the leavs of ſage, roſemarie, chamomile, melilote, elder, and the like, boiled in wine and oil: the following plaſter is much commended by the antients to digeſt, or reſolv and aſſwage the pain, with this which draw's forth thorns, ſplinters, and rotten bones. R. *ſem.urtic. mundat. ſpumæ borac. ſalis ammoniaci, rad.ariſtoloch. rotund. colocynth. terebinth. venet.an.* ℥.x. *ſxung. piperis longi, xylobalſam. thur. myrrhæ, adipis cap. gum.pini, an.* ℥.v. *ceræ,* lbß. *lactis ficus ſylv.* ℥ß. *ex omnibus ſecundùm artem præparatis cum oleo liliorum, & vini generoſi quantitate ſufficiente fiat emplaſtrum.* Let it bee applied to the hip. Or, R. *ſinapi acerrimo aceto diſſoluti,* ℥ii. *fermenti acris,*

acris, ℥ß. *pul. hermodact.* ʒii. *mellis com.* ℥iii. *tereb.* ℥iv. *olei laur. & de ſpicâ, an.* ℥ii. *far. fænug.* ℥iiß. *terræ formicarum cum ovis*, ℔i. *fol. laur. ſalv. rut. roriſm. an.* m.ß. *vermium. terreſt. præpar.* ℔ß. The earth with the eggs and worms ſhall bee boiled apart with the white wine, and herbs cut in pieces, and theſe beeing ſtrained out, the reſt of the things ſhall bee added according to art, and then it ſhall bee applied to the hip. Or elſ, R. *rad. enul. camp. ſigil. ſalom. bryon. biſmal. an.* ℥ii. *coquantur completè & terantur, trajiciantur per ſetaceum, addendo farin. fænug. & hordei, an.* ℥i. *olei liliorum, & chamæm. an.* ℥iii. *tereb.* ℥iv. *ceræ quantum ſufficit, fiat cataplaſma.* It reſolv's, aſſwageth pain, and calleth forth the humors to the skin. Or elſ, R. *rad ſigil. beätæ Mariæ*, ℥vi. *empl. diachyl. albi*, ʒiv. *croci in aquâ vitæ diſſoluti*, ʒii. *terebinth.* ℥i. *ol. de ſpicâ nardi quantum ſufficit, fiat empl.* Let it bee ſpread upon leather, and applied warm. I have oftentimes ſuddenly aſſwaged the pain of the *Sciatica*, by putting to the pained hip the root of black Brionie cut into ſlices, and applied, when the matter was cold. Or elſ, R. *ceræ citrin. & tereb. abiet. an.* ℥ii. *liquefiant ſimul in vaſe duplici, & ubi reſixerint, adde pulv. hermodact.* ℥ß. *flor. chamæm. irid. flor. an.* ʒiii. *ſpicæ nardi, flor. thymi, an.* ʒii. *interioris cinamomi electi. & ſemin. naſturt. an.* ʒii. *croci*, ℈iv. *malaxantur ſimul manibus axungiâ porci vetere non ſalitâ unctis, & fiat maſſa empl.* But if the pain bee not by this means aſſwaged, then muſt wee com to more powerful medicines, as to uſe great cupping-glaſſes applied with much flame, and to veſicatories: As, R. *cantharid. quibus detractæ ſunt alæ*, ʒii. *ſtaphiſagr.* ʒiii. *ſinapi*, ʒiß. *fermenti acerrimi* ℥ß. *incorporentur ſimul, & fiat veſicatorium.* Alſo bliſters may bee raiſed by applying the inner rinde of Travellers-joy to the weight of ſom two drams, a little beneath the grieved part: you muſt have a care that the ulcers that remain after the skin of the bliſters is taken off, do run, and bee kept open for ſom time after, that ſo more of the humor contained in the part may bee drawn away. But if wee cannot avail by theſe means, wee muſt, according to *Hippocrates* his counſel, com to the laſt and extremeſt remedie. *Such* (ſaith hee) *as are troubled with a long pain of the* Sciatica, *have their hip fall out of joint, their leg conſume's, and they becom lame, unleſs they bee burnt.* Wee have alſo read the ſame approved by *Celſus*. *It is the laſt* (ſaith hee) *and moſt effectual medicine in longer diſeaſes, to canterize with hot irons the skin of the hip in three or four places; and then not to heal up theſe ulcers or fontenels as ſoon as may bee, but to keep them open, by putting thereinto bullets of gold, or ſilver, or pills of gentian, or wax melted and wrought up with the powder of vitriol, mercurie, and the like cathereticks, until the affect againſt which wee uſe this remedie bee helped, for by this means manie have been helped.* Therefore three or four actual cauteries, or hot irons ſhall bee ſo thruſt in about the joint of the hip, that they may enter into the fleſh ſom fingers breadth, yet ſo that you ſhun the nervs. Cauteries here do good, for that by heating the part, they heat and diſſolv the cold humors, they cut, attenuate, and draw forth the groſs and viſcid, ſo that they flow out by the ulcers, together with the quitture. Over and beſides, the ligaments are ſtrengthned by their cicatrization, and their looſneſs helped; and by this means the whole part is notably corroborated.

Black brionie diſcuſſeth.

A ſtrong veſicatorie.

The inner rinde of Travellers-joy a veſicatorie.

Aet. ult. ſect. 6.

Lib. 4. cap. 22.

The uſe of cauteries in the *Sciatica*.

CHAP. XXIIII.

Of the flatulent convulſion, or convulſive contraction, which is commonly called by the French, Goute Grampe, *and by the Engliſh*, The Cramp.

What the Cramp is.

THat which the French call *Goute Grampe*, wee here intend to treat of, induced thereto rather by the affinitie of the name, then of the thing; for if one ſpeak truly, it is a certain kinde of convulſion generated by a flatulent matter, by the violence of whoſe running down or motion, oftimes the neck, arms, and legs are either extended, or contracted into themſelvs with great pain, but that for a ſhort time.

The cauſ thereof.

The cauſ thereof is a groſs and tough vapor, inſinuating it ſelf into the branches of the nervs, and the membranes of the muſcles. It take's one on the night, rather then on the day, for that then the heat and ſpirits uſually retire themſelvs into the entrails and centre of the bodie; whence it is that flatulencies may bee generated, which will fill up, diſtend and pull the part whereinto they run, juſt as wee ſee lute-ſtrings are extended. This affect often take's ſuch as ſwim in cold water, and cauſſeth manie to bee drowned, though excellent ſwimmers, their members by this means beeing ſo ſtraightly contracted, that they cannot by anie means bee extended. For the skin, by the coldneſs of the water is contracted and condenſed, and the pores thereof ſhut, ſo that the engendered flatulencies have no paſſage forth. Such as give themſelvs to drunkenneſs and gluttonie, or ſloth and idleneſs, are uſually more frequently troubled with this diſeaſ, by reaſon of their heaping up of crudities.

Who ſubject thereto.

The cure.

Therefore it is cured by moderate diet, and ordering of the bodie, and exerciſe of each part thereof; for thus they gather ſtrength, and the generation of the flatulent matter is hindred. In the verie time when it take's one, the patient ſhall bee cured by long rubbing with warm clothes, and *aquâ vitæ*, wherein the leavs of ſage, roſemarie, thyme, ſavorie, lavander, clovs, ginger, and the like diſcuſſing and reſolving things have been infuſed. The extenſion and flexion of the members or joints, and walking, are alſo good.

The end of the eighteenth Book.

Of the *Lues Venerea*, and those Symptoms which happen by means thereof.

The nineteenth Book.

CHAP. I.

THe French call the *Lues Venerea* the *Neapolitan disease*; the Italians and Germans (as also the English) term it the *French disease*; the Latines call it *Pudendagra*: others name it otherwise. But it make's no great matter how it bee called, if the thing it self bee understood: Therefore the *Lues Venerea* is a disease gotten or taken by touch, but chiefly that which is in unclean copulation; and it partake's of an occult qualitie, commonly takeing its original from ulcers of the privie parts, and then further manifesting its self by pustles of the head, and other external parts; and lastly, infecting the entrails and inner parts with cruel and nocturnal tormenting pain of the head, shoulders, joints, and other parts. In process of time, it causseth knots and hard *tophi*: and lastly, corrupt's and foul's the bones, dissolving them, the flesh about them beeing ofttimes not hurt; but it corrupteth and weakneth the substance of other parts, according to the condition of each of them, the distemper and evil habit of the affected bodies, and the inveteration or continuance of the morbifick cause. For som lose one of their eies, others both: Som lose a great portion of the eie-lids, other-som look verie gastly, and not like themselvs, and som becom squint-eied. Som lose their hearing, others have their noses fall flat, the palat of their mouths perforated with the loss of the bone *Ethmoides*, so that instead of free and perfect utterance, they faulter and fumble in their speech. Som have their mouths drawn awry, others their yards cut off, and women a great part of their privities tainted with corruption. There bee som, who have the *urethra* or passage of the yard obstructed by budding caruncles, or inflamed pustles, so that they cannot make water without the help of a Catheter, readie to die within a short time, either by the suppression of the urine, or by a gangrene arising in these parts, unless you succor them by the amputation of their yards. Others becom lame of their arms, and other-som of their legs, and a third sort grow stiff by the contraction of all their members; so that they have nothing left them sound but their voice, which serveth for no other purpose but to bewail their miseries, for which it is scantly sufficient. Wherefore should I trouble you with mention of those that can scantly draw their breath by reason of an *Asthma*: or those whose bodies waste with an hectick fever, and slow consumption? It fare's far worse with these, who have all their bodies deformed by a leprosie arising there-hence, and have all their throttles and throats eaten with putrid and cancrous ulcers; their hair falling off from their heads, their hands and feet cleft with tetters and scalie chinks: neither is their case much better, who, haveing their brains tainted with this disease, have their whole bodies shaken by fits of falling-sickness; who troubled with a filthie and cursed flux of the bellie, do continually cast forth stinking and bloodie filth. Lastly, there are no kindes of diseases, no sorts of symptoms, wherewith this disease is not complicate, never to bee taken away, unless the virulencie of this murrain bee wholly taken away, and impugned by its proper antidote, that is, *argentum vivum*.

What the *Lues Venerea* is.

What hurt it doth to the bodie.

The Leprosie somtimes the off-spring of the *Lues Venerea*.

CHAP. II.

Of the causses of the Lues Venerea.

THere are two efficient causses of the *Lues Venerea*; the first is, a certain occult and specifick qualitie, which cannot bee demonstrated; yet it may bee referred to God, as by whose command this hath assailed mankinde, as a scourge or punishment to restrain the too wanton and lascivious lusts of unpure whoremongers. The other is an impure touch or contagion, and principally, that which happeneth in copulation. Whether the man or woman have their privities troubled with virulent ulcers, or bee molested with a virulent strangurie (which disease craftie Whores color by the name of the whites) the malignitie catcheth hold of the other; thus a woman taketh

The *Lues Venerea* the scourge of Whore-mongers.

taketh this diſeaſ by a man, caſting it in her hot, open and moiſt womb; but a man taketh it from a woman, which, for example ſake, hath ſom ſmall while before received the virulent ſeed of a whore-maſter polluted with this diſeaſ, the mucous *ſanies* whereof remaining in the wrinckles of the woman's womb, may bee drawn in by the pores of the ſtanding and open yard, whence ſucceed malign ulcers, and a virulent ſtrangurie. This virulencie, like a torch or candle ſet on fire, will by little and little bee propagated and ſent by the veins, arteries and nervs to the noble parts; whoſe malignitie a ſtrong liver not endureing, by the ſtrength of the natural expulſive facultie, will ſend it into the groins, whereon follow abſceſſes, therefore called *Venereal Bubo's*. Theſe, if they return in again, and caſt not forth matter by beeing opened, they will, by their falling back into the veins and arteries, infect the maſs of the blood by the like tainture, and thence will enſue the *Lues Venerea*. Yet this diſeaſ may bee got by a more occult manner of touch, as by breathing onely. For it is not altogether beſides reaſon and experience, that a woman long troubled with this diſeaſ, may by importunate and often kiſſing, transfuſe malignitie into a childe; for the tender and ſoft ſubſtance of a little childe may bee altered, infected, and by little and little corrupted by receiving of filthie, and in their whole kinde malign vapors. For it is known, and now vulgarly beleeved, that mid-wives, by receiving the childe of a woman infected with this diſeaſ, to have got this affect, the malignitie beeing taken and drawn into their bodies through the pores of their hands by the paſſages of the veins and arteries. Neither doth it ſpare anie condition, ſex, nor age of men: for, not onely whoſoever uſe copulation, but ſuch as onely lie with them, may bee taken by this virulencie; yea verily, if they onely lie in the ſheets or coverings which retain his ſweat, or the virulencie caſt forth by an ulcer. The ſame danger may aſſail thoſe who ſhall drink in the ſame veſſel after ſuch as are troubled with this diſeaſ. For by the impure touch of their lips, they leav a virulent *ſanies* and ſpittle upon the edges of the cup, which is no leſs contagious in its kinde then the virulencie of leprous perſons, or the fome of mad dogs. Wherefore it is no marvel if children nurſed by an infected nurſ, draw in the ſeeds of this diſeaſ together with the milk, which is onely blood whitened in the breaſts; or infected ſucking children by their hot and ulcerated mouths, may transfuſe this malignitie into the bodie of the nurſ, by the rare, looſ and porous ſubſtance of the dugs which it frequently ſucketh.

Venereal Bubo's returning in again, occaſion the *Lues Venerea*.

The *Lues Venerea* may bee got by the onely communication of vapor.

How nurſes may infect children, and they their nurſes.

An hiſtorie.

This following hiſtorie is verie memorable to this purpoſe. A certain verie good Cittizen of this Cittie of Paris granted to his wife, beeing a verie chaſte woman, that conditionally ſhee ſhould nurſ her own childe, of which ſhee was lately delivered, ſhee ſhould have a nurſ in the houſ to eaſ her of ſom part of the labor: by ill hap, the nurſ they took was troubled with this diſeaſ; wherfore ſhee preſently infected the childe, the childe the mother, the mother her husband, and hee two of his children, who frequently accompanied him at bed & board, beeing ignorant of that malignitie wherewith hee was inwardly tainted. In the mean while the mother when ſhee obſerved that her nurſ-childe came not forward, but cried almoſt perpetually, ſhee asked my counſel to tell her the cauſ of the diſeaſ; which was not hard to bee don, for the whole bodie thereof was repleniſhed with venereal ſcabs and puſtles, the hired nurſes and the mother's nipples were eaten in with virulent ulcers; alſo the father's, and the two other children's bodies, whereof the one was three, the other four years old, were troubled with the like puſtles and ſcabs. I told them, that they had all the *Lues Venerea*, which took its original and firſt off-ſpring by malign contagion from the hired nurſ. I had them in cure, and by God's help healed them all, except the ſucking-childe, which died in the cure. But the hired nurſ was ſoundly laſhed in the priſon, and ſhould have been whipped through all the ſtreets of the Cittie, but that the Magiſtrate had a care to preſerv the credit of the unfortunate familie.

CHAP. III.

In what humor the malignitie of the Lues Venerea *reſide's.*

ALthough in the opinion of manie the antecedent cauſ of this diſeaſ bee the maſs of blood containing the four humors, yet I had rather place the matter, and primarie, and chief ſeat thereof in groſs and viſcid phlegm infected with the malign qualitie of the venereous venom, and from this beginning and foundation, I think by a certain contagious growth it ſooner or later infect's the other humors, as each of them is diſpoſed or apt to ſuffer. Of which my opinion there are manie arguments, but this chiefly, That by the evacuation of a phlegmatick humor, whether by the mouth and ſalivation, or by ſtool, urine, or ſweat in men of what temper ſoever, whether cholerick, ſanguine or melancholick, the diſeaſ is helped or cured. Secondly, for that the exceſs of pain is more by night then by day, becauſ then the phlegm bearing ſway, ſever's the *perioſtium* from the bone, or elſ offend's it and the reſt of the membranous and nervous bodies by the acrimonie of its malignitie. Thirdly, becauſ the patients are hurt by the uſe of cold things, but uſually finde benefit by hot medicines, whether they bee

Why the pain is worſt upon the night, then on the day.

bee ointments, plaſters fumigations, or whatſoever elſ, inwardly taken, or outwardly applied. Fourthly, for that in venereous puſtles there is found a certain hardneſs at the root, though outwardly they make ſhew of choler or blood. For beeing opened, you ſhall finde them ſtuffed with a certain plaſter-like and tophous matter, or elſ with rough phlegm, or viſcous *pus*; whence ariſe theſe hard *tophi*, or bonie excreſcences upon the bones, if not from phlegmatick humors there heaped up and concrete. Fifthly, for that the ſpermatick and cold parts do primarily and principally feel the harm of this diſeaſ. Sixthly, for that the ulcers which over-ſpread the bodie by reaſon of this diſeaſ, admit of no cure, unleſs you cauſ ſweats. Therefore if the matter of the diſeaſ, and ſuch ulcers as accompanie it, were hot and drie, it would grow worſ, and bee rather increaſed by a decoction of *Guajacum*, the roots of *China*, or *ſarſaparilla*. Seventhly, becauſ oftimes this diſeaſ, the ſeed thereof beeing taken or drawn into the bodie, ſo lieth hid for the ſpace of a yeer, that it ſhew's no ſign thereof, which happen's not in diſeaſes proceeding from an hot matter, which cauſſeth quick and violent motions. By this it appeareth that the *beſis* and foundation of the *Lues venerea* is placed or ſeated in a phlegmatick humor; yet may not denie, but that other humors confuſed therewith may bee alſo in fault, and defiled with the like contagion. For there are ſcarce anie tumors which proceed from a ſimple humor, and that of one kinde, but as in tumors, ſo here the denomination is to bee taken from that humor which carrieth the chief ſway.

This diſeaſ ſomtimes lie's long hid in the bodie before it ſhew it ſelf.

CHAP. IV.

Of the ſigns of the Lues Venerea.

When the *Lues venerea* is lately taken, malign ulcers appear in the privities, ſwellings in the groins, a virulent ſtrangurie runneth oftimes with filthie *ſanies*, which proceed's either from the *proſtatæ*, or the ulcers of *urethra*; the patient is troubled with pains in his joints, head, and ſhoulders, and as it were breakings of his arms, legs and all his members, they are wearie without a cauſ, ſo that neither the foot nor hand can eaſily perform his dutie; their mouths are inflamed, a ſwelling trouble's their throats, which take's away their freedom of ſpeaking and ſwallowing, yea of their verie ſpittle; puſtles riſe over all their bodies, but chiefly certain garlands of them engirt their temples and heads; the ſhedding or loſs of the hair, diſgraceth the head and chin; and leanneſs deformeth the reſt of the bodie; yet all of theſe uſe not to appear in all bodies, but ſom of them in ſom. But the moſt certain ſigns of this diſeaſ are, a callous ulcer in the privities, hard and ill conditioned, and this ſame is judged to have the ſame force in a prognoſtick, if after it bee cicatrized, it retain the ſame callous hardneſs; the Bubo's or ſwellings in the groins to return back into the bodie without coming to ſuppuration or other manifeſt cauſ: theſe two ſigns, if they concur in the ſame patient, you may judg or foretel that the *Lues venerea* is either preſent, or at hand; yet this diſeaſ happeneth to manie without the concourſ of theſe two ſigns, which alſo bewraieth it ſelf by other manifeſt ſigns, as ulcers and puſtles in the reſt of the bodie, rebellious againſt medicines though powerful, and diſcreetly applied, unleſs the whole bodie bee anointed with *Argentum vivum*. But when as the diſeaſ becometh inveterate, manie becom impotent to venerie, and the malignitie and number of the ſymptoms encreaſ, their pains remain fixed and ſtable, verie hard and knotted *tophi* grow upon the bones, and oftimes they becom rotten and foul, as alſo the hands and feet by the corruption of ſalt phlegm are troubled with chops or clefts, and their heads are ſeazed upon by an *ophiaſis* and *alopecia*; whitiſh tumors with roots deep faſtned in, ariſe in ſundrie parts of the bodie, filled with a matter like the meat of a cheſnut, or like a tendon; if they bee opened they degenerate into diverſ ulcers, as putrid, eating, and other ſuch, according to the nature and conditon of the affected bodies. But why the pains are more grievous on the night ſeaſon, this may bee added to the true reaſon wee rendred in the precedent Chapter, firſt for that the venereous virulencie lying as it were aſleep is ſtirred up and enraged by the warmneſs of the bed and coverings thereof; Secondly, by reaſon of the patient's thoughts which on the night ſeaſon are wholly turned and fixed upon the onely ob jeſt of pain.

The moſt certain ſigns of the *Lues venerea*.

Two other cauſes of the exceſs of pain in the night.

CHAP. V.

Of Prognoſticks.

If the diſeaſ bee lately taken, aſſociated by a few ſymptoms, as with ſom ſmal number of puſtles, and little and wandring pains, and the bodie beſides bee young and in good caſe, and the conſtitution of the ſeaſon bee good and favorable, as the Spring, then the cure is eaſie, and may bee happily performed. But on the contrarie, that which is inveterate and enraged by the fellowſhip of manie and malign ſymptoms, as

The ſigns of a curable *Lues venerea*.

as a fixed pain of the head, knots and rottenneſs of the bones, ill-natur'd ulcers in a bodie verie much fallen away and weak, and whereof the cure hath been alreadie ſundrie times undertaken by Empyricks, but in vain; or elſ by learned Phyſicians, but to whoſe remedies, approved by reaſon and experience, the malignitie of the diſeaſ and the rebellious virulencie hath refuſed to yeeld, is to bee thought incureable, eſpecially, if to theſe ſo manie evils, this bee added, that the patient bee almoſt waſted with a conſumption and hectick leanneſs, by reaſon of the decaie of the native moiſture. Wherefore you muſt onely attempt ſuch by a palliative cure; yet bee warie here in makeing your prognoſtick: for many have been accounted in a deſperate caſe, who have recovered; for by the benefit of God and nature, wonders oftimes happen in diſeaſes. Young men who are of a rare or lax habit of bodie are more ſubject to this diſeaſ, then ſuch as are of a contrarie habit and complexion. For as not all who are converſant with ſuch as have the Plague, or live in a peſtilent air, are alike affected; ſo neither all who lie or accompanie with ſuch as have the *Lues venerea*, are alike infected or tainted. The pains of ſuch as have this diſeaſ, are far different from the pains of the Gout. For thoſe of the Gout return and torment by certain periods and fits, but the other are continual and almoſt alwaies like themſelvs; Goutie pains poſſeſs the joints, and in theſe condenſ a plaſter-like matter into knots; but thoſe of the Pocks are rather faſtned in the mid'ſt of the bones, and at length diſſolv them by rottenneſs and putrefaction. Venereous ulcers which are upon the yard are hard to cure, but if beeing healed, they ſhall remain hard and callous, they are ſigns of the diſeaſ lying hid in the bodie.

The ſigns of an incureable noe.

How theſe pains differ from thoſe of the gout.

Generally, the *Lues venerea* which now reigneth is far more milde and eaſie to bee cured then that which was in former times, when as it firſt began amongſt us: beſides, each day it ſeemeth to bee milder then other. Aſtrologers think the cauſ hereof to bee this, for that the celeſtial influences which firſt brought in this diſeaſ, in ſucceſs of time by the contrarie revolutions of the Stars, loſe their power and becom weak; ſo that it may ſeem ſomwhat likely, that at length after ſom few yeers it may wholly ceaſ; no otherwiſe then the diſeaſ termed *Mentagra*, which was verie like this in manie ſymptoms, and troubled manie of the Romans in the reign of *Tiberius*; and the *Lichen*, which in the time of *Claudius* (who ſucceeded *Tiberius*) vexed not onely *Italie*, but all *Europe* beſides. Yet Phyſicians had rather take to themſelvs the glorie of this leſs rageing diſeaſ, and to refer it to the manie and wholſom means, which have been invented, uſed and oppoſed thereto by the moſt happie labors of noble wits.

The *Lues venerea* becom's more gentle then formerly it was.

CHAP. VI.

How manie, and what means there are to oppugn this diſeaſ.

Why the decoction of *Guaicum* is not ſufficient to impugn the diſeaſ.

MAnie ſorts of remedies have been found out by manie to oppugn and overcom this diſeaſ. Yet at this daie there are onely four which are principally uſed. The firſt is by a decoction of *Guaicum*; the ſecond by unction; the third by emplaſters, and the fourth by fumigation: all of them by *Hydrargyrum*, the firſt excepted. Yet that is not ſufficiently ſtrong and powerful; for experience hath taught, that the decoction of *Guaicum* hath not ſufficient ſtrength to extinguiſh the venom of the venereous virulencie, but onely to give it eaſ for a time; for becauſ it heat's, attenuate's, provoke's ſweat and urine, waſt's the excrementitious humors by drying them, it ſeemeth to cure the diſeaſ, for that thereupon, for ſom time, the pain and all other ſymptoms ſeem more remiſs; but theſe endeavors are weak and deceitful, as whereby that onely which is more ſubtle in the humors in fault, is exhauſted and diſperſed by ſweat. But *Hydrargyrum* is a certain higher power, contain's therein all the power of *Guaicum*, yet much more excellent and efficacious; for beſides that it heat's, attenuate's, cut's, reſolv's and drie's, it provoke's ſweat and urine, and beſides it expel's noxious humors upwards and downwards, by the mouth and ſtool. By which evacuations not onely the more ſubtle, but alſo the more groſs and feculent excrements, wherein the ſeat of this diſeaſ is properly fixed, are diſperſed and evacuated; by which the Phyſician may bee bold to aſſure himſelf of certain victorie over the diſeaſ. But after the uſe of the decoction of *Guaicum*, freſh pains and knots ariſe by the reliques of the more groſs and viſcous humors left in the cavities of the entrails; but *Hydrargyrum* leav's no reliques behinde it.

Hydrargyrum ſufficient to overcom the diſeaſ.

CHAP. VII.

How to make choice of the wood Guaicum.

THat is preferred before the reſt, which is of a great log, of a duskie color, new, gummie, with a freſh ſtrong ſmell, an acrid and ſomwhat biteing taſte, the bark cleaving verie cloſe to the wood. It hath a facultie to heat, rarifie, attenuate, attract, to cauſ ſweat, and move urine, and beſides by a ſpecifick propertie to weaken the virulencie of the *Lues venerea*.

The facultie.

nerea. There are three ſubſtances taken notice of in this wood: the firſt is the bark, the other is a whitiſh wood which is next to the bark, the third is the heart of the wood, that is the inner, blackiſh, and more duskie part thereof. The bark is the more drie, wherefore you ſhall uſe it when as you would drie more powerfully; the midle ſubſtance is more moiſt, becauſ it is more ſucculent and fat; that which lieth between both, is of a milde temper. Wherefore the two laſt are more convenient for delicate natures and rare bodies, which require leſs drying. Furthermore, the bark muſt bee given to denſ and ſtrong natures, that by the more fierie force thereof, the humors may bee made more fluid, and the paſſages of the bodie more paſſable. But I would here bee underſtood to mean ſuch bark as not putrid & rotten with age, to which fault it is verie ſubject, for that long before it bee ſhipped by our people, the wood lieth in heaps upon the ſhore in the open air, until they can finde chapmen for it; which when it is brought aboard, it is ſtowed in the hold or bottom of the ſhip, where beneath by the ſea through the the chinks of the boards, and above by the mariners, it uſually gathereth much dirt. When it is brought hither to us, it is bought and ſold by weight, wherefore, that it may keep the weight, the Druggiſts lay it up in vaults and cellars under ground, where the ſurface thereof bedewed with much moiſture, can ſcarce eſcape mouldineſs and rottenneſs. Wherefore, I do not like to give the decoction either of the bark or wood which is next thereto to ſick people.

The parts.

The hot and fierie faculti of the bark.

CHAP. VIII.

Of the preparation of the decoction of Guaicum.

FIrſt you muſt have your *Guaicum* ſhaved into ſmall pieces, and to everie pound of the ſhaveings, add of fair water eight, ten, or twelv pintes, more or leſs as the nature of the partie, and condition of the diſeaſ ſhall ſeem to require, according to the rule of the formerly mentioned indications. Let the water bee hot or warm, eſpecially if it bee in Winter, that ſo it may the more eaſily and throughly enter into the bodie of the wood, and draw into it ſelf the faculties thereof in the ſpace of twentie four hours, wherein it is macerated; then boil it in *in balneo*, to avoid *empyreuma*, or taſte of fire, which it will contract by boiling it over a hot fire. Yet ſom, nothing regard this, but think the patient ſufficiently ſerved, if they make a decoction in an earthen-pot well glazed, over a gentle fire, ſo that no part of the liquor may run over the mouth of the veſſel, for that thus ſo much of the ſtrength of the decoction might vaniſh away. Howſoever it bee made, let it bee boiled to the conſumption of half, a third, or fourth part, as the nature of the patient, and diſeaſ ſhall ſeem to require. There bee ſom who mix diverſ ſimples therwith, which have an occult and proper ſympathie with that part of the bodie which is principally hurt by the diſeaſ, which at the leaſt may ſerv in ſtead of a vehicle to carrie the faculties of the decoction thither where the diſeaſ moſt reigneth. Others add thereto purgeing medicines, whoſe judgment I cannot approve of, for that I think it is not for the patient's good to attempt two evacuations at once; that is to expell the humors by ſweat, by the habit of the bodie, and by purgeing by the bellie; for that as much urine, ſo alſo much ſweat ſhew's little evacuation by ſtool. For theſe two motions are contrarie, which nature cannot brook at once. For purgeing draw's from the Circumference to the Center, but ſweat run's a quite contrarie courſ, and this is the opinion of manie and great Phyſicians. This firſt decoction beeing boiled out and ſtrained, the like quantitie of water ſhall bee put to the ſtuff, or maſs, that ſo beeing boiled again without anie further infuſion, and ſtrained, with the addition of a little cinnamon for the ſtrengthening of the ſtomack, the patient may uſe it at his meals, and between his meals, if hee bee drie, for his ordinarie drink. The quantitie of the firſt decoction to bee taken at once, ought to bee ſom five or ſix ounces, and it ſhall bee drunk warm, that ſo it may bee the ſooner brought into action, and leſt the actual coldneſs ſhould offend the ſtomach; and then the patient beeing well covered, ſhall keep himſelf in bed, and there expect ſweat which if it come ſlowly on, it ſhall bee helped forwards with ſtone-bottles filled full of water, and put to the ſoles of the feet. If anie parts in the interim ſhall bee much pained, they ſhall bee comforted by applying of ſwines-bladders half filled with the ſame decoction heated. Neither will it bee unprofitable before the decoction bee drunk, to rub over all the bodie with warm linnen clothes, that by this means the humors may bee attenuated, and the pores of the skin opened. When hee ſhall have ſwet ſom two hours, the parts oppoſite to the grieved places, ſhall firſt bee wiped, then preſently, but more gently the grieved parts themſelvs, leſt a greater conflux of humors flow thereto. Theſe things beeing don, hee ſhall keep himſelf in bed, ſhunning the cold air until hee bee cooled and com to himſelf again, ſom two hours after hee ſhall ſo dine, as the diſeaſ and his former cuſtom ſhall ſeem to require; ſix hours after, betakeing himſelf to his bed, hee ſhall drink the like quantitie of the decoction, and order himſelf as before. But if hee bee either weak, or wearie of his bed, it ſhall bee ſufficient to keep the houſ without lying down; for although hee ſhall not ſweat, yet there will bee a great diſſipation of the vapors

The proportion of the *Guaicum* to the water.

Why the decoction ought to bee performed with a drie heat.

Whether it bee fit to add purges to a decoction of *Guaicum*.

Hip. aph. ult. ſect. 6.

How, and in what quantitie this decoction muſt bee taken.

How to drie the ſweat of the bodie.

vapors, and venenate ſpirits, by inſenſible tranſpiration; for the *Lues venera* by the onely communication of theſe, often times catcheth hold, and propagat'es it ſelf in lying with a bedfellow tainted therewith. But as it is requiſite to have let blood, and purged the bodie by the advice of a Phyſician, before the takeing of the decoction of *Guaicum*; ſo whil'ſt hee doth take it, it much conduceth to keep the bellie ſoluble (which is much bound by the heat and drieneſs of ſuch a drink) and to preſerv the puritie of the firſt veins by a glyſter, or laxative medicine taken everie fifth, or ſixth day. But for the uſe of it, wee muſt warily obſerv, takeing indication, not onely from the malignitie and contumacie of the diſeaſ, but alſo from the particular nature of the patient; for ſuch as have their bodie waſted by heat & leanneſs, & their skin drie and ſcalie (whence you may gather a great aduſtion of the humors, &, as it were, a certain incineration of the habit of the bodie) muſt more ſpareingly make uſe of theſe things, but rather temper the bodie by humecting things taken inwardly, and applied outwardly, as bathes, ointments without Quick-ſilver, and other ſuch like things. And then a verie weak decoction of *Guaicum* ſhall bee uſed for a few daies before your unction with Quick-ſilver. A more plentiful diet, as it draw's forth the diſeaſ, which of its own nature is long, ſo a more ſpareing and ſlender diet make's the ulcers more rebellious and contumacious, by a hectick drieneſs.

How long this decoction muſt bee uſed.

The manner of diet.

Therefore a middle courſ muſt bee kept, and meats made choice of which are fit, and naturally engender good and laudable juice in the bodie. For it is not onely great ignorance, but much more crueltie, to go about to contein all patients without anie difference, within the ſtrait allowance of four ounces of Ship-bisket, & twelv damask prunes: for I judg it far better to diet the patient with Lamb, Veal, Kid, Pullets, fat Larks, and black-birds, as thoſe which have a greater familiaritie with our bodies, then Prunes and the like Junkets. Let his bread bee made of white wheat, well levened, neither too new, or tough, neither too old or hard. Let his drink bee made of the maſs, or ſtrainings of the firſt decoction of *Guaicum* boiled with more water, as was formerly mentioned; yet if there ariſe anie great weakneſs of the faculties, you may permit the uſe of ſom little wine, drinking eſpecially before each a cup of the laſt mentioned decoction. Let him avoid ſleep preſently after meat, for ſo the head is filled with groſs vapors. Paſſions, or perturbations of the minde muſt alſo bee avoided, for that by theſe the ſpirits are inflamed and diſſipated; all the delights of honeſt pleaſure are to bee deſired, but venerie wholly avoided, as that which weaken's all the nervous parts. Manie in ſtead of a decoction of *Guaicum*, uſe a decoction of *China*. Now this *China* is the root of a certain Ruſh, knottie, rare, and heavie, when it is freſh, but light when it is waxed old; it is alſo without ſmell, whence manie judg it void of anie effectual qualitie, it is brought into uſe out of *India*, it it thus prepar'd, it is cut into thin round ſlices, boil'd in fountain or river water, and is given to patients to drink morning & evening after this manner. Re. *rad. chin. in talcol. ſect.* ℥ii. *aquæ font.* ℔xii. *infundantur per hor.* xii. *& coquantur ad conſumption. tertiæ partis.* Let him take ℥vi. in the morning, and ſo much at night; let him expect a ſweat in his bed: a ſecond decoction may bee made of the maſs remaining of the firſt, but with a leſs quantitie of water put thereto, which alſo by longer boiling may draw forth the ſtrength remaining in the maſs, and bee uſed at meals for ordinarie drink. There are ſom who make a third decoction thereof, but that is wholly unprofitable & unuſeful. *Sarſaparilla* is prepared alſo juſt after the ſame manner.

To whom, and what manner of wine may bee allowed

The deſcription of *China*.

The preparation.

Of *Sarſaparilla*.

CHAP. IX.

Of the ſecond manner of cureing the Lues Venerea, *which is performed by friction or unction.*

When the bodie muſt bee prepared with humecting things before unction.

THe cure of the *Lues Venerea* which is performed by unction and friction is more certain, yet not in everie kinde, condition and ſeaſon thereof. For if the dieaſ bee inveterate from an humor, tough, groſs, viſcous, and more tenaciouſly fixed in the ſolid parts, as you may gather by the knottie tumors of the bones; for then wee are ſo far from doing anie good with a friction uſed at the firſt, that on the contrarie wee bring the patient in danger of his life, unleſs wee ſhal have firſt prepared the humor to expulſion, by emollient and digeſting things firſt uſed. But if it bee lately taken with moveable pains, puſtles, and ulcers in the jaws, throat and privie parts, then may it bee eaſily cured without ſuch preparatives, eſpecially if the humor bee ſufficiently obedient, and as it were prepared of it ſelf, and its own nature. Therefore firſt uſeing general medicines, you may afterwards com to uſe the unction with *Hydrargyrum*.

CHAP. X.

Of the choice preparation and mixing of Hydrargyrum.

HYdrargyrum which is cleer, thin, white and fluid, is the beſt: on the contrarie, that which is livid, and not ſo fluid, is thought to bee aduiterated by the admixture of ſom lead.

lead. That it may bee the purer, ſtrain it through ſom ſheep's-leather, for by preſſing it, when it is bound up, it paſſeth through by its ſubtiltie, and leav's the filth and leaden droſs behinde it on the inside. Then it may bee boil'd in vineger with ſage, roſemarie, thyme, camomille, melilote, and ſtrained again, that ſo manie waies cleanſed, it may enter into ointments and plaſters: To kill it more ſurely, it ſhall bee long wrought, and as it were ground in a mortar, that it may bee broken and ſeparated into moſt ſmall particles, that by this means it may not bee able to gather it ſelf into the former bodie: to which purpoſe you may alſo add ſom *ſulphur*, or *ſublimate*, as wee ſhall ſhew hereafter. It is moſt uſually mixed with hogs-greaſ, adding thereto ſow oil of turpentine, nutmegs, cloves, ſage, and *Galen's* treacle. If a *Leucophlegmatia* together with the *Lues Venerea* affect the bodie, then hot, attenuateing, cutting and dying things ſhall bee added to the medicine, which ſhall bee provided for unction; the ſame ſhall bee don when as wee would have it to enter into the ſubſtance of the bones. But if the patient bee of a cholerick temper, and his blood eaſie to bee inflamed, you ſhall make choice of leſs hot, attractive and diſcuſſing things. As when the bodie ſhall bee repleniſhed with knottie and ſcirrhous tumors, or ſqualid by exceſſive drineſs, then ſhall emollient and humecting things mixed therewith. But that ſuch ointments may have a better conſiſtence, I uſe to add to each pound thereof, four, five, or ſix yolks of hard eggs. Therefore this ſhall bee the form of the ointment called Vigoes. R. *axung. porci*, ℔i. *olei chamæm. aneth. maſtich. & laurini, an.* ℥i. *ſtyrac. liquid.* ʒx. *rad enulæ, camp. parùm tritæ, & ebuli, an.* ℥iii. *pul. euphorb.* ℥ß. *vini oderif.* Ri. *bulliant omnia ſimul uſque ad conſumptionem vini, deinde colentur; colaturæ adde lythargyræ auri,* ʒvi. *thuris, maſtich. an.* ʒvi. *reſ. pini* ℥iß. *tereb. venet.* ℥i. *argenti vivi* ℥iv. *ceræ albæ* ℥iß. *liquefactis oleis, cum cerâ incorporentur omnia ſimul, fiat linimentum ad uſum.* Or elſ, R. *argenti vivi præparati* ℥vi. *ſublimiti,* ℥ß. *ſulphuris vivi,* ℥ß. *axung. porci, ſalis expertis,* ℔i. *vitellos ovorum ſub cineribus coctorum,* nu. iii. *olei terebinth. & laurini, an.* ℥ii. *theriac. vet. & methridat.* ℥ß. *fiat linimentum ut artis eſt.* You ſhall compoſe it thus, firſt the *ſublimatum* and *ſulphur* ſhall bee finely poudred, then ſom part of the *Argentum vivum* and hog-greaſ put to them, then preſently after, ſom of the hard yolks of eggs, continually and diligently ſtirring and mixing them all together. All theſe beeing well incorporate, add ſom more *Argentum vivum*, hogs-greaſ, and yolks of eggs, and incorporate them with the former; at the laſt add the oils, then treacle, and methridate, and ſo let them all bee beaten together for a whole daies ſpace, and thus you ſhall make an oinment of a good conſiſtence, which I have often uſed with good ſucceſs. Yet the hogs-greaſ ſhall bee firſt boiled with the hot herbs good for the ſinews, as ſage, roſemarie, thyme, marjerom, lavander and others which the ſeaſon afford's. For ſo the *axungia* acquire's a more attenuating facultie, and conſolidateing of thoſe parts which the *Lues Venerea* afflict's. Beſides, when unguents are made for this purpoſe, that ſuch virulencie may bee drawn from within outwards, by ſweats and tranſpiration through the pores of the skin, no man need doubt, but that they ought to bee furniſhed with relaxing, and rarifying, and attractive faculties. But *axungia*, beſides that it verie fit ro kill the *Argentum vivum*, it alſo relaxeth and molliſieth. Now *Oleum laurinum, de ſpicâ, rutaceum*, rarifie, digeſt and aſſwage pain. Turpentine alſo extinguiſheth and bridleth the *Argentum vivum*, moderately heat's, reſolv's and ſtrengthen's the nervous parts. But *Argentum vivum* is the proper antidote of the *Lues Venerea*, as that which cure's it howſoever uſed, drying by the ſubtiltie of the parts, and provokeing ſweat. Verily Treacle and Methridate ſomwhat conduce to retund the virulencie of this diſeaſ, but unleſs *Argentum vivum* aſſiſt as a ferret to hunt, and an *Alexiterium* to impugn the diſeaſ, they can do no great matter

How to kill *Argentum vivum.*

What to mix therewith.

An unction with *Argentum vivum.*

Another.

How to make it.

How to prepare the hog's-greaſ before you mix the *Argentum vivum* therewith.

CHAP. XI.

How to uſe the Unction.

THe bodie and humors apt to cauſe or nouriſh a *plethora* or inflammation, beeing prepared by digeſtive ſirups, and evacuated by purgeing and bleeding as is fitting, according to the direction of ſom Phyſitian, the patient ſhall bee ſhut up in a parlor or chamber, hot either by nature or art, and free from cold blaſts of winde. For cold is moſt pernitious in this diſeaſ, both for that it hurt's the nervous parts, alreadie ill affected by reaſon of the diſeaſ, as alſo for that it leſſen's the efficacie of medicines. Wherefore manie do ill in this, who, whether in winter or ſummer, annoint their patients in a large room, expoſed on everie ſide to the windes. They deal ſomwhat more wiſely, who put a cloth faſtned like half a tent preſently behinde the patient, though annointed by the fire-ſide, ſo to keep away the cold air from him Yet it is ſafeſt to ſet, and annoint the patient either in a little room, or elſ in ſom corner of a large room, ſeparated from the reſt of the room by ſom hangings, and building a ſtove, or makeing ſom fire therein, for ſo hee hee may ſtand or ſit as hee beſt like's, the longer, and with the leſs offence, and bee equally heated on everie ſide, whereas ſuch as are annointed in a chimney by a fire's ſide cannot but bee heated unequally, beeing readie to burn on the one ſide, whil'ſt the other is cold, which motions are contrarie and hurtful to that wee require: beſides, if the patient ſhall bee weak, hee

Cold moſt hurtful to ſuch as are troubled with the *Lues venerea.*

hee cannot ſtand and endure the heat of the fire. Or if hee bee ſhamefac't, hee will bee unwilling to ſhew all his bodie at once naked to the Surgeon, but hee may without anie harm, and with modeſtie, lying on a bed in a little room, wherein a ſtove is made, have all his lims annointed about the joints, and preſently bound up, either with ſtoups, or carded cotton, or brown paper.

CHAP. XII.

What cautions to bee obſerved in rubbing or annointing the Patient.

The patient, if it may bee conveniently don, muſt bee annointed faſting.

HEe ſhall bee annointed or rubbed over with the ointment in the morning, the concoction and diſtribution of the meat beeing perfected, which functions otherwiſe would not bee well performed, the powers of nature beeing diſtracted into ſeveral operations. Yet if the patient ſhall bee weak, you may ſom hour before the unction, give him ſom gellie, the yolk of an egg, or ſom broth made of meat, boiled to pieces, but verie ſpareingly, leſt nature, intent upon the concoction of ſolid meats, or in great quantitie, ſhould bee drawn away from that which wee intend. At firſt, let onely the joints of the lims bee annointed, as about the wreſts, elbows, knees, anckles, ſhoulders. But afterward, if the patient ſhall bee more ſtrong, and a greater commotion of the humors and bodie ſeem neceſſarie, the emunctories of the principal parts may alſo bee annointed, and the whole ſpine of the back; yet haveing much care, and alwaies ſhunning the principal and noble parts, leſt wee ſhould do as thoſe butcherlie Empericks do, who equally, and in like manner daub and rub over all the bodie, from the ſoles of the feet, to the crown of the head: moreover, diligent regard muſt bee had of thoſe parts, which are ſeazed upon by the ſymptoms of this diſeaſe, that they may bee more annointed, and that it may bee more throughly rubbed in. Yet you muſt alwaies begin your annointing or rubbing at thoſe parts which are leſs offended, leſt the humors ſhould bee drawn in greater meaſure to the grieved part. And as gentle fricatiōns do not ſufficiently open the pores of the skin, ſo more ſtrong and hard ones ſhut them up, cauſ pain, and more plentifully attract the morbifick matter. Wherefore it will bee more couvenient to uſe moderate frictions, takeing indication from the ſtrength of the patient, as that whereto wee muſt ſtill have the chief regard. There is alſo another thing whereto the Phyſician and Surgeon muſt diligently attend, as that, which if it bee not carefully prevented, will either haſten the death of the patient, or make him ſubject to a relapſ; that is, the quantitie of the remedies and unctions, and the number of the frictions. Which conſideration, together with that which is of the degrees of the temperaments of the whole bodie, and each part thereof, much trouble's the mindes of good Phyſicians, and maketh the art conjectural, it is far from beeing attained to by Empericks. Yet wee muſt endeavor by method and reaſon, that by the rule of indications ſo frequently mentioned, wee may attain to the knowledg thereof, as near as may bee. For to have perfect knowledg hereof, and to ſay that thoſe need onely four, others five, and otherſom ſix, more or fewer frictions at the beginning, which Empericks commonly do, is a thing both impoſſible and vain. All theſe muſt bee changed and ordered according to the malignitie and continuance of the diſeaſ, and the condition of the affected bodies. Verily wee muſt ſo long uſe frictions and unctions, until the virulent humors bee perfectly evacuated by ſpitting and ſalivation, by ſtool, urine, ſweat, or inſenſible tranſpiration. Which you may underſtand by the falling away and drying up of the puſtles and ulcers, and the ceaſing of the pains and other ſymptoms proper to this diſeaſ. In manie, by reaſon of the more denſ and compact habit of the bodie nature is more ſlow in excretion. Yet I have learn't by long experience, that it is beſt to annoint and chafe ſuch twice in a daie, to wit, morning and evening, ſix hours after meat. For ſo you ſhall profit more in one daie, then by the ſingle friction of three daies. But on the contraie, I have often, and with good ſucceſs, rubbed over but each other day more rare and delicate bodies, giveing them one or two daies reſt to recollect their ſtrength, which by the too much diſſolution of their ſpirits becomming too weak, were not ſufficient to expell the reliques of the morbifick matter. And certainly about the end of the appointed friction, eſpecially when as the patient begin's to flux at the mouth, the bodies, together with the noxious humors are made ſo fluid by the means of the precedent friction, that one friction is then more efficacious then two were at the beginning. Therefore as *Galen* bid's, when as the diſeaſ is great, and the ſtrength of the patient infirm, that wee ſhould part our blood-lettings, and draw a little and a little at once; ſo alſo here when as wee ſhall obſerv nature ſtirred up, and readie bent to anie kinde of evacuation by the mouth, ſtool, or other like; you ought not to uſe anie unction or friction oftner then once in a daie; yea, certainly it will bee better to intermit for ſom few daies. For thus *Maſſa* report's, that there was a certain man who almoſt waſted with a conſumption beeing continually afflicted with the moſt grievous pains of this diſeaſ, and reputed in a deſperate caſe by other Phyſicians, was notwithſtanding at length recovered by him, when as hee had annointed him thirtie ſeven times, putting ſom time between for the recoverie of his ſtrength.

In what places the bodie muſt bee annointed.

Where to begin the unction.

What it is that maketh the art of Phyſick conjectural.

Who muſt bee rubbed over once, who twice in a daie, and who but everie other daie.

Lib. de vene ſect.

I my

I my ſelf have obſerved others, who thus, by the interpoſition of one or two daies, beeing rubbed over ſom fifteen or ſeventeen times, have perfectly recovered. Wherefore you muſt take this courſ in reſolved and weak bodies, yet in the *interim* muſt you have a care, that the frictions bee not too weak, and ſo few, that the morbifick cauſ may not bee touched to the quick: for in this kinde of diſeaſ nature doth not of it ſelf endeavour anie *criſis*, or excretion; it require's the auxiliarie forces of medicines, by whoſe aſſiſtance it may expell all the malignitie. Theſe are ſigns of ſuch a *criſis*, either at hand, or alreadie preſent, if the patient bee ſo reſtleſs, ſo loath all things, that hee cannot remain in one place either ſtanding or lying, hee can neither eat nor drink, if hee bee oppreſſed with a continual wearineſs, almoſt readie to ſwound, yet have a good and equal pulſ, and gripeings in his bellie afflict him with bloodie and viſcous dejections, until at length nature after one or two daies portion of the morbifick matter beeing ſpent, bee ſomwhat free'd, and all pains and ſymptoms ſo much abated, as the excretions have proceeded. But whereas medicines are not ſufficient in number or ſtrength, there follow's an imperfect *criſis*, which leav's behinde it ſom reliques of the morbifick matter, which like leaven do ſo by little and little infect the whole maſs of the humors, that oftimes after ten years ſpace, the diſeaſ riſeth as out of an ambuſh, or lurking-hole, and becom's far worſ then before. But wee muſt in like manner have a care leaſt theſe medicines, that are either given inwardly, or applied outwardly, bee not too ſtrong: for by cauſſing ſuch colliquation of the radical moiſture and ſolid parts, manie have been brought into an incureable conſumption. In others ſordid and putrid ulcers have thence ariſen in the mouth, which having eaten a great part of the pallate and tongue, have degenerated into a deadly *Cancer*. In others hereupon the tongue hath ſo ſwelled up, that it hath filled the whole capacitie of the mouth, ſo that it could not bee bended to anie part of the mouth for chawing, whereupon they have by little and little been famiſhed. In other ſom there hath been cauſſed ſo great colliquation of humors, that for a whole moneth after, tough and filthie ſlaver hath continually flowed out of their mouths. Other ſom have the muſcles of their jaws relaxed; others troubled with a convulſion, ſo that dureing the reſt of their lives they can ſcarce gape. Others, by loſing a portion of their jaw, have loſt ſom of their teeth. But you muſt not alwaies ſo long annoint and chaſe the bodie, until a flux of the mouth or bellie appear. For you may finde ſundrie perſons, who, if you ſhould annoint or rub them to death, you cannot bring them to flux at the mouth; yet theſe will recover notwithſtanding, excretion beeing made either by inſenſible tranſpiration, or evacuation of urine, or ſom gentle flux of the bellie, either procured by art, or comming of it ſelf. In which caſe I have obſerved that manie have received much good by a purgeing decoction of *Guaicum*, adminiſtred according to the quantitie of the peccant humor, and given for ſom daies in the morning, adding thereto white wine, if the bodie abounded with tough and viſcid humors. Dyſenteries, or bloodie Fluxes cauſſed by unctions, may bee helped by glyſters, wherein much Hogſ-greaſ is diſſolved to rotund the acrimonie cauſſed by the medicine and humor which nouriſheth the Dyſenterie. Alſo new treacle diſſolved in new milk, is thought wonderfully to mitigate this ſymptom.

Nature is not ſufficiently able to expel the virulent matter.

Signs that the *criſis* is nigh.

Inconveniences following upon immoderate unctions.

For what perſons a purgeing decoction of *Guaicum* is good.

The cure of a Dyſenterie occaſioned by too ſtrong friction.

CHAP. XIII.

Of the third manner of cure, which is performed by cerates, and emplaſters, as ſubſtitutes of unctions.

FOr that ſundrie by reaſon of the name abhor the uſe of friction, which is performed by the fore-mentioned ointments, therefore there is found out another manner of cure by cerates and emplaſters, as ſubſtitutes of Frictions, but that uſually is ſomwhat ſlower; for which purpoſe it is not needful onely to uſe the things which are deſcribed by *Vigo*, but you may alſo deviſe other, which are more or leſs anodyne, emollient, attenuating, diſcuſſing, or drying, according to the condition of the preſent diſeaſ, ſymptoms, humors and patient, never omitting *Hydrargyrum*, the onely antidote of this diſeaſ. Such emplaſters mitigate pains and knots, and reſolv all hardneſs, and are abſolutely verie effectual, for continually ſticking to the bodie, they continually operate. Wherfore they are of prime uſe in relapſes of this diſeaſ, or when the humors are thick and viſcous, or otherwiſe lie deep in the bodie, and verie difficult to root out. But for that they work more ſlowly oftimes, ſuch as uſe them are forced at length to uſe ſom frictions to ſtimulate nature, and cauſ the ſpeedier excretion. Yet in ſom whoſe bodies and humors have been fluid, either by nature or art, the applied emplaſters have in three daies ſpace procured evacuation ſufficient for the diſeaſ, ſo that if they had not been taken away, they would have cauſſed a colliquation, like that which wee lately mentioned in too violent friction. Wherefore you ſhall uſe the like diſcretion in takeing of theſe, as you uſe in your unctions and friction. In ſtead of *emp. de Vigo*, this following may bee fitly uſed. ℞ *maſſæ emp. de melil. & oxycrocei, an.* ℔ß. *argenti vivi extin.* ℥vi. *oleo laurino, & de ſpicâ, reducantur*

The cure by emplaſters more ſlow.

In what caſe they are chiefly uſeful.

The deſcription of an emplaſter.

reducantur ad formam emplaſtri. Theſe plaſters muſt bee equally ſpread upon lether, and laid upon the ſame places of the joints, as were formerly mentioned in the cure by frictions. Yet ſom there bee, who cover with the plaſter all the arm, from the hand even to the ſhoulder, and all the leg from the top of the knee, even to the ends of the toes, which thing I do not diſallow of, if ſo bee that the places of the joints bee covered over with a thicker plaſter. They muſt bee left ſticking there ſo long, until nature bee ſtirred up and provoked to cauſ excretion of the virulent humors. Yet if in the *interim* great itching ſhall ariſe in the parts, you may take them off ſo long until the parts ſhall bee fomented with a decoction of the flowers of camomile, melilote, red roſes, and the like made in wine, to diſcuſs that which cauſed the itching, and then you may lay them on again. Som, to hinder the riſeing of anie itch, lay not the bare plaſter to the part, but cover it over with ſarcenet, ſo to keep it from ſticking, and thus intercept the tranſpiration of the part, the cauſ of itching. They ſhall bee ſtronger or weaker, and lie to the part a longer or ſhorter ſpace, as long as the indications, ſo often formerly mentioned, ſhall ſeem to require. The effects of emplaſters are the ſame as of frictions; for they cauſ excretion, one while by inſenſible tranſpiration, otherwhiles by a *Diarrhœa*, or flux of the bellie; ſomtimes by urines, but moſt frequently (which *Criſis* is alſo moſt certain) by ſalivation. Sordid and virulent ulcers often breed in the mouth, tongue, pallate and gums by ſalivation, by reaſon of the acrimonie of the virulent humors adhering to the ſides of the mouth: to hinder the growth of theſe, manie inject glyſters made of emollient things, eſpecially at the beginning of the ſalivation, ſo to draw downwards the humors forceibly flying up in greater quantitie then is fit, although the part it ſelf may endure them.

What excretion beſt in this diſeaſ.

There are alſo ſom, who to the ſame end give a purgeing medicine at the verie time when as the humors are readie to move upwards, the which I think is not a ſafe courſ. The cure of ſuch ulcers is far different from the cure of others. For they ought by no means to bee repercuſſed or repelled, how inflamed ſoever they bee, but onely to bee mitigated by gargariſms, ſo onely to leſſen the heat, and that by this frequent waſhing of the mouth, you may hinder the ſticking or furring of viſcid humors to ſuch like ulcers. A decoction of barlie, cow's-milk warm, held and gargled in the mouth, the mucilages of the ſeeds of mallows, marſh-mallows, *pſilium*, lettuce, line extracted in the water of barlie, mallows, and pellitorie of wall, are good for this purpoſe; for thus the ulcers becom more milde, and the tenacitie of the adherent humors is looſed. You muſt at the firſt beware of ſtrong detergent medicines, for almoſt all ſuch have acrimonie joined with them, which will encreaſ the pain, but chiefly in the ſtate of the diſeaſ: for ſo, the ulcers gently cleanſed by frequent gargling, would becom worſ by the uſe of acrid things. Therefore it ſhall bee ſufficient to make uſe of the fore-mentioned medicines, ſo to hinder the encreaſ of the filth, and inflammation of the ulcers, if ſo bee that ſuch ulcers bee not too exceeding malign and burning. For if it ſhall happen either by the powerful efficacie of the applied plaſters, or by the violence of nature in its motion of the ill humors upward, that ſuch ſtore of viſcous and groſs humors are carried to the mouth, that it want's little, but that the part it ſelf is over-ruled by the morbifick matter, ſo that by the violence and continuance of the flux, the mouth and jaws becom ſo ſwelled, that a gangrene is to bee feared, by hindering the entrance of the ſpirits, and extinguiſhing of the native heat of theſe parts. In this caſe wee are forced to leav the proper cure for to withſtand the accidents, and for this purpoſe wee uſe reſtrictive and repelling things, ſuch as are barlie water, plantain, night-ſhade, knot-graſs, ſhepherds-Purſ, and the like, with ſyrup of roſes, violets, quinces, berberies, pomegranates and the like; alſo ſuch are the mucilages and decoctions of the ſeeds of lettuce, *pſilium*, quinces, plantain, night-ſhade, water-lillies, wood-bine, &c. Alſo it is convenient to procure ſweats by ſtoves, or the application of anie hot and drie things; for thus the humors which run forth of the veſſels into all the ſurface of the bodie are diverted. But when as the courſ of the humors running to the mouth, is beginning to ſtop, and the tumors and ulcers begin to leſſen, then nothing hinder's, but that wee may uſe gently detergent things, as, *ſyrup. roſarum ſiccarum*, *mel roſatum*, *Diamoron*, *Dianucum*, and the like. But when it is time to drie the ulcers, they may bee lightly touched with alum-water, or with *aqua fortis*, ſuch as Gold-ſmiths have uſed for the ſeparation of metals. They may alſo frequently uſe drying gargariſms made with aſtriction of the waters of roſes, plantain, night-ſhade, ſhepherd's-purſ, knot-graſs, and dog's-tongue, boiling therein *balauſtia*, *roſ. rub. myrtil. ſumach. alumen. acacia*, *berber. gallæ maliror.* and the like. Dureing the time of fluxing or ſalivation you muſt diet and feed the patient with liquid meats, and thoſe of good juice, and eaſie digeſtion, for that then hee can neither chaw, ſwallow, nor digeſt hard things. For nature wholly intent upon the excretion of the noxious and peccant humors, as alſo weakned by the bitterneſs of pain, watchings, and unquietneſs, and conſequently a great reſolution of the ſpirits, cannot inſiſt powerfully upon the work of concoction. Therefore hee ſhall bee fed with rear new-laid eggs, candles of the ſame, barlie-creams, culleſſes made of a decoction of knuckles of veal, and a capon, and gellies, and with

Reſtrictive and repelling gargariſms.

To drie the ulcers of the mouth.

Manner of diet when the mouth is ulcerated.

To avoid the ulcers of the mouth.

To cure them.

with theſe in ſmall quantitie, but frequently adminiſtred, alwaies gargling his mouth before hee eat. For his drink hee ſhall uſe a decoction of *Guaicum* aromatized with a little cinnamon; but if anie deſire that the drink ſhall becom nouriſhment, for that the patients cannot feed on more ſolid meats, you may give them old wine, claret and thin, mixed with ſom barlie-water. Som there are who ſteep ſom crums of pure manchet in the foreſaid wine, and then preſs it out, but yet ſo, that there may ſom part of the bread remain therein, which may make it more nouriſhing, and leſs ſharp or acrid. Others ſteep bread hot out of the oven, in wine, for the ſpace of a night, then they diſtil it all over in *balneo Mariæ*; the liquor which firſt com's over is more ſtrong and hot, but that which flow's out afterwards, more milde, and ſuch as the patient may uſe to mix with his wine without anie danger, for his better nouriſhment, and the recoverie of his ſtrength. To make their drink nouriſhing.

For to refreſh the ſpirits in fear of fainting, muskedine, hippocras, roſe-vineger, and the like, put to the noſe to ſmell to, will bee ſufficient, unleſs peradventure the patient ſhould naturally abhor ſuch things, for ſo they would rather deject the powers and ſpirits. In the *interim*, you muſt have care of the bellie, that you keep it open by gentle and emollient glyſters.

CHAP. XIIII.

Of the fourth manner of cureing the Lues Venerea.

SOm have deviſed a fourth manner of cureing the *Lues Venerea*, which is by *ſuffitus*, or fumigations. I do not much approov hereof, by reaſon of ſundrie malign ſymptoms which thence ariſe, for they infect and corrupt by their venemous contagion, the brain and lungs, by whom they are primarily and fully received, whence the patients dureing the reſidue of their lives have ſtinking breaths. Yea manie while they have been thus handled, have been taken hold of by a convulſion, and a trembling of their heads, hands, and legs, with a deafneſs, apoplexie, and laſtly, miſerable death, by reaſon of the malign vapors of ſulphur and quick-ſilver, whereof *cinnabaris* conſiſt's, drawn in by their mouth, noſe, and all the reſt of the bodie. Wherefore I can never approov the uſe of ſuch fumigations which are to bee received in fumes by the mouth and notſtrils for to work upon the whole bodie; yet I do not diſlike of that, which is undertaken for ſom one part onely, as to drie up ill-conditioned ulcers, which ſo affect it, that they cannot bee overcom by anie other means, or for to diſperſ or digeſt knots, or to reſolv fixed pains, otherwiſe unmoveable. Theſe fumigations, by reaſon of the admixture of *argentum vivum*, have an attenuating, cutting, reſolving, and colliquating facultie. Thoſe who prepare theſe fumigations for the cure of the whole diſeaſ and bodie, take this courſ. They put the patient under a tent or canopie made cloſe on everie ſide, leſt anie thing ſhould expire, and they put in unto him a veſſel filled with hot coles, whereupon they plentifully throw *Cinnabaris*, that ſo they may on everie ſide enjoy the riſeing fume, juſt after the ſame manner as Farriers uſe to ſmoak their horſes for the glaunders: they repeat this everie day ſo long, until they begin to flux at the mouth. The principal matter or *baſis* of ſuch fumigations, as wee have alreadie noted, is *Cinnabaris* conſiſting of ſulphur and *argentum vivum* mixed together; there is added alſo, *radix ireos flor. thus, olibanum. myrrha, juncus odoratus, aſſa odorata, maſticbe, terebinthina, & theriaca*, all which have a facultie to reſolv and ſtrengthen the ſpirits, and nature, and correct the ſtinch and evil qualitie of the *argentum vivum*. There are alſo other fumigations made after another manner, but that alſo when as the *argentum vivum* is extinct, and as it were fix after this manner; let ſom lead bee melted, & let there bee poured or put thereto ſom *argentum vivum*, then let it all bee powdred, adding thereto antimonie, aloës, maſtich, copreſs, orpiment, and benjamin made into powder, and framed into Trochiſces with ſom turpentine. Or elſ, R*e cinnabaris*, ℥i. *ſtyracis rub. & calamitæ, nucis moſchat. an.* ℥iii. *benzoini*, ℥ß. *excipe terebinth. fiant trochiſci ponderis* ℥ii. for the fore-ſaid uſe. The *terebinthina* is added to incorporate the drie things, and the gums are added to yield matter to the fume. But virulent ulcers of the *Lues Venerea* ſhall not bee fumigated before they bee cleanſed; alſo this following fumigation is good. R*e cinnab.* ℥i. *benzoini, myrrhæ, ſtyracis, olibani, opopanacis, an.* ℥ß. *maſtiches, macis, thuris, an.* ℥ii. *excipiantur terebinthina, & fiat ſuffumigium.*

The burt that follow's upon fumigations.

What fumigatious good.

The common manner of uſing them.

The matter of them.

Trochiſces for fumigations.

CHAP. XV.

The cure of the ſymptoms, or ſymptomatick affects of the Lues Venerea: *and firſt, of the Ulcers of the Yard.*

CAllous and malign ulcers in this diſeaſ may grow all over the yard; but theſe are far more malign which ariſe on the prepuce, then thoſe that grow on the *Glans*, or nut of the yard. Now they are rebellious to the common medicines of ulcers which happen other-waies, and they are alſo ſubject to turn into a gangrene, ſo that ſundrie, who have not in time provided for themſelvs by the

The ulcers of the prepuce more malign then thoſe of the *Glans*.

the uſe of *argentum vivum*, are forced for their negligence to ſuffer the loſs of their *Glans*, and oftimes of their whole yard. Yet I am of opinion, that I think wee muſt begin the cure of all ulcers of the yard with the general remedies of ulcers. For all ulcers ariſing in theſe parts by reaſon of copulation, are not virulent. But when as wee ſhall finde that wee doe no good by this means, and that the diſeaſ notwithſtanding grow's worſ and worſ, then muſt wee com to make uſe of ſuch things as receiv *argentum vivum*, that by theſe wee may reſiſt the virulencie which is readie to diſperſ it ſelf over all the bodie, yet it is abſolutely neceſſarie that all theſe things bee endued with ſuch faculties as may retund the malign acrimonie of this venom, ſuch an one is this following *collyrium* of *Lanfranck*. R. *vini albi*, ℔i. *ag. roſ. & plan. ag.* an. quart. 1. *auripig.* ℥ii. *viridis æris*, ℥i. *aloës, myrrhæ*, an. ℈ii. *terantur ſubtiliſſimè, & fiat collyrium*. Alſo theſe ulcers may bee profitably touched with mercurie-water, or *aqua fortis* which the Gold-ſmiths have uſed, or elſ mercurie in powder, or our *ægyptiacum*: but the falling away of the Eſchar ſhall bee procured with *baſilicon*, or freſh butter. Yet I think it not fit to uſe theſe acrid things without verie great caution, for fear of a gangrene, which eaſily happen's to this part. But if ſuch ulcers are ſo ſtubborn, that they will not yeild to theſe remedies, then muſt we com to the friction or unction of the groins, *perinæum*, and ulcers, with the ointments formerly preſcribed for the general friction. Alſo ſumigations may bee made, as wee mentioned in the former chapter. For thus at length the malignitie of the virulent humor will bee overcom, and the callous hardneſs mollified; and laſtly, the ulcers themſelvs cleanſed, and beeing cleanſed, conſolidated. Sometimes after the perfect cure of ſuch ulcers, there will appear manifeſt ſigns of the *Lues Venerea* in manie, which ſhewed not themſelvs before, for that the virulencie flowed forth of the running ulcers, and now this vent beeing ſtopt, it flow's back into the bodie, and ſhew's ſigns thereof in other parts; and theſe men have need of a general unction.

Lanfranck's *collyrium*.

* This which by our Autor is here termed *Strangurea virulenta*, and in French *Chaudepiſſe*, is the ſame which by other Autors is uſually termed *Gonorrhœa virulenta*, and by us vulgarly in Engliſh, *The running of the reins*.

CHAP. XVI.

How a Gonorrhœa *differeth from a* * *virulent Strangurie.*

EVen to this day verie manie have thought that the virulent Strangurie hath ſom affinitie with the *Gonorrhœa* of the Antients, but you ſhall underſtand by that which follow's, that they are much different. For a *Gonorrhœa* is an unvoluntarie effuſion of ſeed running from the whole bodie to the genitals, by reaſon of the reſolution and palſie of the retentive facultie of theſe parts, as it is delivered by *Galen, lib. de loc. affect.* This diſeaſ befalleth others by the collection of the blood and ſeminal matter by the veſſels of the whole bodie, which not turning into fat and good fleſh, take's it courſ to the genitals; but on the contrarie, a virulent Strangurie is a running, or rather dropping out of the urinarie paſſage, of a yellowiſh, livid, bloodie, filthie *ſanies*, like to *pus*, or matter not well concocted, oftentimes fretting and exulcerating the paſſage with the acrimonie, and cauſſing a painful erection of the yard, and diſtenſion of all the genital parts. For in this erection there is cauſſed as it were a convulſive contraction of theſe parts. And hence it is that the patients complain, that they feel as it were a ſtring ſtretched ſtiff in that part, which draw's the yard as it were downwards. The cauſ hereof is a groſs and flatulent ſpirit, filling and diſtending by its plentie, the whole channel or hollow nerv; yea verily, the whole porous ſubſtance of the yard. If to theſe ſymptoms this bee added, that the urinarie paſſage bee exulcerated, a grievous pain afflict's the patient, whil'ſt hee make's water, for that the ulcers are irritated by the ſharp urine paſſing that way. Such a virulent ſtrangurie or running of the reins oftimes continueth for two or three years ſpace: but the *Gonorrhœa*, or running of the ſeed cannot endure ſo long, but that it will bring the bodie to an extreme and deadlie leanneſs, for that the matter of the ſeed is of the more benign and laudable portion of the blood, as you may perceiv by thoſe who have too immoderately uſed copulation but the ſpace of one night. For ſuch have their faces more lean and lank, and the reſt of their bodies enervated, languiſheth and becommeth dull. By this wee have delivered, it may bee perceived that the running of a virulent ſtrangurie, is not the running of a ſeminal humor, fit for generation of iſſue, but rather of a viſcous and acrid filth, which hath acquired a venenate malignitie by the corruption of the whole ſubſtance.

What a virulent ſtrangurie is.

The cauſ of the convulſive diſtenſion of the yard.

Vid. Aut. de ſim. med. apud Galen.

What kinde of matter floweth forth in a virulent ſtrangurie.

CHAP. XVII.

Of the cauſſes and differences of the ſcalding, or ſharpneſs of the urine.

THe heat or ſcalding of the water, which is one kinde of the virulent ſtrangurie, ariſeth from ſom one of theſe three cauſſes; to wit, repletion, inanition, and contagion. That which proceed's from repletion, proceed's either from too great abundance of blood, or by a painful and tedious journie in the hot ſun, or

The cauſ of a particular repletion of the privie parts.

or by feeding upon hot, acrid, diuretick and flatulent meats causſing tenſion and heat in the urinarie parts, whence proceed's the inflammation of them and the genital parts, whence it happen's that not onely a ſeminal, but alſo much other moiſture may flow unto theſe parts, but principally to the *proſtatæ*, which are glandules ſituate at the roots, or beginning of the neck of the bladder, in which place the ſpermatick veſſels end; alſo abſtinence from venerie cauſſeth this plenitude in ſom who have uſually had to do with women, eſpecially the expulſive facultie of the ſeminal and urinarie parts beeing weak, ſo that they are not of themſelvs able to free themſelvs from this burden. For then the ſuppreſſed matter is corrupted, and by its acrimonie contracted, by an adventitious and putredinous heat, it cauſſeth heat and pain in the paſſage forth. The *proſtatæ* ſwelling with ſuch inflamed matter, in proceſs of time becom ulcerated, the abſceſs beeing broken. The purulent *ſanies* dropping and flowing hence alongſt the urinarie paſſage cauſſes ulcers by the acrimonie, which the urine falling upon, exaſperate's; whence ſharp pain, which alſo continueth for ſom ſhort time after makeing of water, and together therewith by reaſon of the inflammation, the pain's attraction, and the vaporous ſpirit's diſtenſion, the yard ſtand's, and is contracted with pain, as wee noted in the formed Chapter. But that which happen's through inanition, is acquired by the immoderate and unfit uſe of venerie, for hereby the oilie and radical moiſture of the fore-mentioned glandules is exhauſted, which waſted and ſpent, the urine cannot but bee troubleſom and ſharp by the way to the whole *uretbra*. From which ſenſ of ſharp pain, the ſcalding of the urine hath its denomination. That which com's by contagion, is cauſſed by impure copulation with an unclean perſon, or with a woman, which ſom ſhort while before hath received the tainted ſeed of a virulent perſon, or elſ hath the whites, or her privities troubled with hidden and ſecret ulcers, or carrieth a virulent ſpirit ſhut up or hidden there, which heated and reſuſcitated by copulation, preſently infect's the whole bodie with the like contagion, no otherwiſe then the ſting of a Scorpion or *Phalangium*, by caſting a little poiſon into the skin, preſently infect's the whole bodie, the force of the poiſon ſpreading further then one would believ, ſo that the partie fall's down dead in a ſhort while after. Thus therefore the ſeminal humor contained in the *proſtatæ*, is corrupted by the tainture of the ill drawn thence by the yard, and the contagion infect's the part it ſelf; whence follow's an abſceſs, which caſting forth the virulencie by the urinarie paſſage, cauſſeth a virulent ſtrangurie; and the malign vapor carried up with ſom portion of the humor unto the entrails and principal parts, cauſ the *Lues Venerea*.

The cauſſes of the inanition of the genital parts.

The reaſon of a contagious ſtrangurie.

CHAP. XVIII.

Prognoſticks in a virulent Strangurie.

WEe ought not to bee negligent or careleſs in cureing this affect, for of it proceed pernicious accidents, as wee have formerly told you, and neglected, it becom's uncureable, ſo that ſom have it run out of their urinarie paſſage dureing their lives; oftimes to their former miſerie is added a ſuppreſſion of the urine, the *proſtatæ* and neck of the bladder beeing inflamed and unmeaſurably ſwelled. Copulation, and the uſe of acrid or flatulent meats increaſ this inflammation, and alſo together therewith cauſ an *Iſcburia*, or ſtoppage of the urine; they are worſ at the change of the Moon: certain death follow's upon ſuch a ſtoppage; as I obſerved in a certain man, who troubled for ten years ſpace with a virulent ſtrangurie, at length died by the ſtoppage of his water. Hee uſed to bee taken with a ſtopping of his urine, as often as hee uſed anie violent exerciſe, and then hee helped himſelf by putting up a ſilver Catheter, which for that purpoſe hee ſtill carried about him; it happened on a certain time, that hee could not thruſt it up into his bladder, wherefore hee ſent for mee, that I might help him to make water, for which purpoſe when I had uſed all my skill, it proved in vain: when hee was dead, and his bodie opened, his bladder was found full, and verie much diſtended with urine, but the *proſtatæ* preternaturally ſwelled, ulcerated, and full of matter reſembling that which formerly uſed to run out of his yard, whereby you may gather, that this virulencie flow's from the *proſtatæ*, which run's forth of the yard in a virulent ſtrangurie, and not from the reins, as manie have imagined. Certainly, a virulent ſtrangurie, if it bee of anie long continuance, is to bee judged a certain particular *Lues Venerea*, ſo that it cannot bee cured unleſs by frictions with *Hydrargyrum*. But the ulcers which poſſeſs the neck of the bladder are eaſily diſcerned from theſe which are in the bodie or capacitie thereof. For in the later the filth com's away as the patient make's water, and is found mixed with the urine, with certain ſtrings or membranous bodies comming forth in the urine: to theſe may bee added, the far greater ſtinch of this filth which iſſueth out of the capacitie of the bladder. Now muſt wee treat of the cure of both theſe diſeaſes, that is, the *Gonorrhœa* and virulent Strangurie; but firſt of the former.

A virulent ſtrangurie continue's with ſom dureing their lives.

An hiſtorie.

From what part the matter of a virulent ſtrangurie flow's.

CHAP. XIX.

The chief heads of cureing a Gonorrhœa.

Diet.

LEt a Phyſician bee called, who may give direction for purgeing, bleeding and diet, if the affect proceed from a fulneſs and abundance of blood and ſeminal matter; all things ſhall bee ſhunned which breed more blood in the bodie, which increaſ ſeed, and ſtir to venerie. Wherefore hee muſt abſtain from wine, unleſs it bee weak and aſtringent, and hee muſt not onely eſchue familiaritie with women, but their verie pictures, and all things which may call them to his remembrance, eſpecially if hee love them dearly; ſtrong exerciſes do good, as the carrying of heavie burdens even until they ſweat, ſwimming in cold water, little ſleep, refrigerations of the loins and genital parts, by annointing them with *unguentum roſarum refrigerans Galeni & nutritum*, putting thereupon a double cloth ſteeped in oxycrate, and often renewed. But if the reſolution or weakneſs of the retentive facultie of theſe parts bee the cauſ of this diſeaſ, contracted by too much uſe of venerie before they arrive at an age fit to perform ſuch exerciſe; in this caſe ſtrengthning and aſtringent things muſt both bee taken inwardly, and applied outwardly. But now I haſten to treat of the virulent Strangurie, which is more proper to my purpoſe.

For a ſtrangurie occaſioned by repletion.

For the decaie of the retentive facultie.

CHAP. XX.

The general cure both of the ſcalding of the water, and the virulent Strangurie.

Diet.

WEe muſt diverſly order the cure of this diſeaſ, according to the varietie of the cauſſes and accidents thereof. Firſt, care muſt bee had of the diet, and all ſuch things ſhunned as inflame the blood, or cauſ windineſs; of which nature are all diuretick and flatulent things, as alſo ſtrong and virulent exerciſes. Purgeing and bleeding are convenient, eſpecially, if fulneſs cauſ the affect. Womens companies muſt bee ſhunned and thoughts of venereous matters; the patient ought not to lie upon a ſoft bed, but upon a quilt or matterice, and never, if hee can help it, upon his back: boiled meats are better then roſted, eſpecially boil'd with ſorrel, lettuce, purſlain, cleanſed barlie, and the four cold ſeeds beaten: for ſauce, let him uſe none, unleſs the juice of an orange, pomegranate, or verjuice; let him ſhun wine, and in ſtead thereof uſe a decoction of barlie and liquorice, an *hydromel*, or *hydroſaccarum* with a little cinnamon, or that which is termed *Potus divinus*. In the morning let him ſup of a barlie cream, wherein hath been boiled a *nodulus* of the four cold ſeeds beaten together with the ſeeds of white poppie; for thus it refrigerateth, mitigateth and cleanſeth; alſo the ſyrups of marſh-mallows and maiden-hair are good. Alſo purgeing the bellie with half an ounce of *Caſſia*, ſomtimes alone, otherwhiles with a dram or half a dram of Rubarb in powder put thereto, is good. And theſe following pills are alſo convenient. R. *maſſæ pilul. ſine quibus* ℈i. *rhei electi* ʒß. *caphuræ* gr. iiii. *cum terebinthinâ formentur pilulæ*; let them bee taken after the firſt ſleep. Venice turpentine alone, or adding thereto ſom Rubarb in powder, with oil of ſweet almonds newly drawn without fire, or ſom ſyrup of maiden-hair, is a ſingular medicine in this caſe, for it hath an excellent lenitive and cleanſing facultie, as alſo to help forwards the expulſive facultie, to caſt forth the virulent matter contained in the *proſtatæ*. You may by the bitterneſs perceiv how it reſiſt's putrefaction, and you may gather how it perform's its office in the reins and urinarie parts, by the ſmell it leav's in the urine after the uſe thereof. But if there bee anie who cannot take it in form of a bole, you may eaſily make it potable, by diſſolving it in a mortar with the yolk of an egg, and ſome white wine, as I learned of a certain Apothecarie, who kept it as a great ſecret. If the diſeaſ com by inanition or emptineſs, it ſhall bee helped by fattie injections, oilie and emollient potions, and inwardly takeing and applying theſe things which have the like facultie, and ſhunning theſe things which cauſſed the diſeaſ. How to cure that which happen's by contagion, or unpure copulation, it ſhall bee abundantly ſhewed in the enſuing Chapter.

Pills.

The force of Venice-turpentine in this diſeaſ.

How to bee made potable.

CHAP. XXI.

The proper cure of a virulent Strangurie.

An injection to ſtay inflammation.

FIrſt, wee muſt begin with the mitigation of pain, and ſtaying the inflammation, which ſhall bee performed by makeing injection into the *uretbra*, with this following decoction warm. R. *ſem. pſilii, lactucæ, papav. albi, plantag. cydon. lini, byoſcyami albi, an.* ʒii. *detrahantur mucores in aquis ſolani & roſar. ad quantitatem ſufficientem, adde trochiſc. alborum Rhaſis camphoratorum in pollinem redactorum,* ʒi. *miſce ſimul, & fiat injectio frequens.* For this becauſ it hath a refrigerateing facultie, will help the inflamma-

inflammation, mitigate pain, and by the mucilaginous facultie lenifie the roughnes of the *urethra*, and defend it by covering it with the slimie substance, against the acrimonie of the urine and virulent humors. In stead hereof you may use cow's milk newly milked, or warmed at the fire. Milk doth not onely conduce hereto, beeing thus injected, but also drunk, for it hath a refrigerateing and cleansing facultie, and by the subtiltie of the parts it quickly arrive's at the urinarie passages. Furthermore, it will bee good to annoint with *cerat. refriger. Galeni addita camphora*, or with *ceratum centalinum*, *ung. comitissæ*, or *nutritum*, upon the region of the kidnies, loins and *perinæum*, as also to annoint the cods and yard. But before you use the foresaid ointments or the like, let them bee melted over the fire, but have a care that you make them not too hot, least they should lose their refrigerateing qualitie, which is the thing wee chiefly desire in them. Haveing used the foresaid ointment, it will bee convenient to applie thereupon som linnen clothes moistened in oxycrate, composed *ex aquis plantaginis, solani, sempervivi, rosarum*, and the like. If the patient bee tormented with intolerable pain in makeing water, and also som small time after, as it commonly commeth to pass, I would wish him that hee should make water, putting his yard into a chamber-pot filled with milk or water warmed. The pain by this means beeing asswaged, wee must com to the cleansing of the ulcers by this or the like injection: R. *hydromelitis sympt.* ℥iv. *syr. de rosis siccis, & de absinth. an.* ℥ß. *fiat injectio.* But if there bee need of more powerful detersion, you may safely add, as I have frequently tried, a little *ægyptiacum*. I have also found this following decoction to bee verie good for this purpose. R. *vini albi odoriferi*, ℔ß. *aquar. plantag. & ros. an.* ℥ii. *auripigmenti*, ʒß. *viridis æris*, ℈i. *aloes opt.* ʒß. *pulverisentur pulverisanda, & bulliant simul.* Keep the decoction for to make injection withall. You may increas or diminish the quantitie and force of the ingredients entring into this composition, as the patient and disease shall seem to require. The ulcers beeing thus cleansed, wee must hasten to drie them, so that wee may at length cicatrize them. This may bee don by drying up the superfluous moisture, and strengthning the parts that are moistned and relaxed by the continual defluxion, for which purpose this following decoction is verie profitable. R. *aq. fabrorum*, ℔i. *pisidiarum, balaust. nucum cupres. conquassatorum, an.* ʒiß. *semin. sumach. & berber. an.* ʒii. *syrup. rosar. & de absinth. an.* ℥i. *fiat decoctio.* You may keep it for an injection to bee often injected into the *urethra* with a syringe, so long as that there shall no matter or filth flow over thereat, for then there is certain hope of the cure.

The faculties of milk against a virulent strangurie.

How to make water without pain.

Detergent injections.

How the cleansed ulcers may bee dried.

CHAP. XXII.

Of Caruncles, or fleshie excrescences which somtimes happen to grow in the Urethra, *by the heat or scalding of the urine.*

A Sharp humor which flow's from the Glandules, termed *Prostatæ*, and continually run's alongst the urinarie passage, in som places by the way it fret's, and exulcerate's by the acrimonie the *urethra* in men, but the neck of the womb in women. In these, as also is usual in other ulcers, there somtimes grow's up a superflous flesh, which oftimes hinder's the casting or comming forth of the seed and urine by their appropriate and common passage, whence manie mischiefs arise; whence it is that such ulcers as have caruncles growing upon them must bee diligently cured. But first wee must know whether they bee new or old. For the later are more difficultly to bee cured then the former, becaus the caruncles that grow upon them becom callous and hard, beeing oftimes cicatrized. Wee know that there are caruncles, if the *Catheter* cannot freely pass alongst the passage of the urine, but finde's so manie stops in the way, as it meet's with caruncles that stop the passage; if the patient can hardly make water, or if his water run in a verie small stream, or two streams, or crookedly, or onely by drop and drop, with such tormenting pain, that hee is readie to let go his excrements, yea and oftimes doth so, after the same manner as such as are troubled with the stone in the bladder. After makeing water, as also after copulation, som portion of the urine and seed staie's at the rough places of the caruncles, so that the patient is forced to press his yard, to press forth such reliques. Somtimes the urine is wholly stopped, whence proceed's such distension of the bladder, that it causseth inflammation, and the urine flowing back into the bodie, hasten's the death of the patient. Yet somtimes the urine thus suppresst, sweat's forth preternaturally in sundrie places, as at the fundament, *perinæum*, cod, yard, groins. As soon as wee, by anie of the fore-mentioned signs, shall suspect that there is a caruncle about to grow, it is expedient forthwith to use means for the cure thereof; for a caruncle from a verie little beginning doth in a short time grow so big, that at the length it becom's incureable: verily, you may easily gues at the difficultie of the cure by that wee have formerly delivered of the essence hereof, besides, medicines can verie hardly arrive thereat. The fittest season for the undertakeing hereof is the Spring, and the next thereto is Winter; yet if it bee verie troublesom, you must delaie no time. Whilest the cure is in hand, the patient ought wholly to abstain from venerie, for by the use thereof, the kidnies, spermatick vessels, *prostatæ*, and the whole yard,

How caruncles com to grow upon the ulcers of the genital parts.

Callous caruncles hard to cure.

Signs.

The suppresst urine com's forth whereas it can get vent.

The fittest time for the cure.

Why venerie must bee eschued.

yard, ſwell up and wax hot, and conſequently draw to them from the neighboring and upper parts, whence abundance of excrements in the affected parts, much hindering the cure. You muſt beware of acrid and corrodeing things in the uſe of detergent injections, for that thus the *uretbra* beeing endued with moſt exquiſite ſenſ, may bee eaſily offended, whence might enſue manie ill accidents. Neither muſt wee bee frighted, if at ſom times wee ſee blood flow forth of ſecret or hidden caruncles. For this help's to ſhorten the cure, becauſ the diſeaſis hindered from growth, by takeing away portion of the conjunct matter, the part alſo it ſelf is eaſed from the oppreſſing burden, for the material cauſ of caruncles is ſuperfluous blood. Wherefore unleſs ſuch bleeding happen of it ſelf, it is not amiſs to procure it by thruſting in a *Catbeter* ſomwhat hard, yet with good advice. If the caruncles bee inveterate, and callous, then muſt they bee mollified by fomentations, ointments, cataplaſms, plaſters, and fumigations; you may thus make a fomentation. R. *rad.altb.& lilior.alb.an.*℥iv. *rad.bryoniæ, & fœnic.an.*℥iß *fol malvar. violarum, parietar. & mercur.an.* m.ß. *ſem. lini. fœnugr.an.* ℥ß. *caricas ping.*nu.xii. *florum chamæm.& melil.an.*p.i. *contundantur contundenda, incidenda incidantur, bulliant omnia in aquâ communi*: make a fomentation, and applie it with ſoft ſponges. Of the maſs of the ſtrained-out things, you may make a cataplaſm after this manner. R. *prædicta materialia, terantur, & trajiciantur, adde axungiæ porci, unguenti baſiliconis, an.*℥ii. *fiat cataplaſma*: let it bee applied preſently after the fomentation. You may uſe this following liniment whil'ſt the cataplaſm is providing. R. *unguenti altb.& agrippæ an.*℥iß. *æſipi humidæ, & axung. human.an.*℥i. *butyri recentis, olei lilior.& chamæm. an.*℥vi. *liquefiant ſimul, addendo aquæ vitæ* ℥i. *fiat linimentum*: let it bee applied outwardly upon the part wherein the caruncles are. For the ſame purpoſe plaſters ſhall bee applied, which may bee diverſified, and fitted as you ſhall think good; yet *Emplaſtrum de Vigo* truly made, exceedeth all the reſt in a mollifying facultie, and in waſteing ſuch callous hardneſs. The following fumigation is alſo good for the ſame purpoſe; take ſom pieces of a mill-ſtone (for this wee uſe in ſtead of the *pyrites* mentioned by the Antients) or elſ ſome bricks of large ſize, after they are heated hot in the fire, let them bee put into a pan, and ſet under a cloſe ſtool, then cauſ the patient to ſit thereon, as if hee were going to ſtool, then pour upon the hot ſtones equal parts of verie ſharp vineger, and verie good *aqua vitæ*, and caſting clothes about him, that nothing may exhale in vain: let him receiv the aſcending vapor at his fundament, *perinæum, ſcrotum*, and *uretbra*. Moreover, that this medicine may work the better effect, you may put the patient naked into the barrel noted with this letter A. ſo that hee may ſit upon a ſeat or board perforated on that part, whereas his genitals are, then place the pan, holding the hot ſtones between his legs, then preſently ſprinkle the ſtones with the fore-mentioned liquor, by the door marked with the letter B. Thus the patient ſhall eaſily receiv the fume that exhale's therefrom, and none thereof bee loſt, hee covering and vailing himſelf on everie ſide. Such a fumigation in *Galen's* opinion, hath a facultie to penetrate, cut, reſolv, ſoften and digeſt ſcirrhous hardneſſes.

The particular cure.

A fomentation

A cataplaſm.

A liniment.

Vigo's emplaſter effectual to ſoften a Caruncle.

A *ſuffumigium.*

Ad Glauc. lib. 2. cap. 5.

A Barrel fitted to receiv the fume in.

CHAP.

CHAP. XXIII.

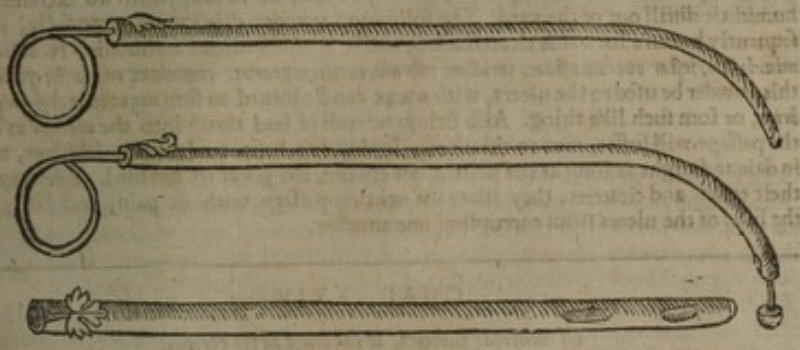
What other remedies ſhall bee uſed to Caruncles occaſioned by the Lues Venerea.

BUt if you ſuſpect that theſe Caruncles com or are occaſioned by a virulent humor, or the malignitie of the *Lues venerea*, it is meet that the patient obſerv ſuch a diet as uſually is preſcribed to ſuch as are troubled with the *Lues Venerea*; let him uſe a decoction of *Guaicum*, and let the *perineum* and the whole yard bee annointed with ointment made for the *Lues Venerea*; otherwiſe the Surgeon will loſe his labor. In the interim, whil'ſt hee ſhall ſweat in his bed, hee ſhall bee wiſhed to hold between his legs a ſtone-bottle filled with hot water, or elſ a hot brick wrapped in linnen cloaths, moiſtened in vineger and *aqua vitæ*; for thus the heat and vapor will aſcend to the genitals, which, together with the help of the applied ointment, will diſſolv the matter of the Caruncles, and beeing thus ſoftened, they muſt bee conſumed with convenient medicines. Wherefore firſt if they becom callous, or cicatrized (which you may ſuſpect if they caſt forth no excrementitious humiditie) they ſhall bee exaſperated, excoriated and torn with a leaden *Catheter* haveing a rough button at the end like a round file. Hee ſhall ſo long uſe the *Catheter* put into the *Urethra*, thruſting it up and down the ſame way ſo long and often as hee ſhall think fit for the breaking and tearing the Caruncles, hee ſhall permit them thus torn to bleed freely, ſo to eaſe the affected part. You may alſo for the ſame purpoſe put into the *Urethra* the *Catheter* marked with this letter B; whereinto putting a ſilver wier ſharp at the upper end, that by often thruſting it in and out it may wear and make plain the reſiſting Caruncles. Verily, by this means I have helped manie much perplexed with the fearful danger of this diſeaſ. Som better like of the *Catheter* marked with this letter A, beeing thus uſed: it is thruſt into the *Urethra* with the prominent cutting ſides downwards, and then preſſing the yard on the outſide cloſe with your hand to the *Catheter* in the place where the Caruncles are, it is drawn forth again.

Particular defaults of the *Lues Venerea* not to bee cured unleſs by the general remedie of the virulencie.

Caruncles, if callous, muſt firſt bee ſoftened.

Catheters fit to wear aſunder, or tear Caruncles.



A *ſheweth the* Catheter *with the inſerted ſilver wier, but not hanging forth thereat.*
B *ſheweth the* Catheter *with the inſerted ſilver wier hanging forth at the end.*

The Caruncle thus torn ſhall bee ſtrowed over with the following powder, beeing verie effectual to waſte ard conſume all Caruncles of the privities without much pain. R. *herb. ſabin. in umbrâ exſiccat.* ℥ii. *ocræ, antimon. tutb. præparat. an.* ℥ß. *fiat pulv. ſubtiliſſimus*, let it bee applied in the following manner. Put the powder into the pipe or *Catheter* haveing holes in the ſides thereof, the which is the lowermoſt of the laſt deſcribed. Then put the *Catheter* into the urinarie paſſage until the ſlit or openneſs of the ſide com to the Caruncle, then into the hollowneſs of the *Catheter* put a ſilver wier, wrapped about the end with a little linnen rag, which as it is thruſt up, will alſo thruſt up the powder therewith, until it ſhall com to the ſlit againſt the caruncle, then will it adhere to the caruncle, bloodie, by reaſon of the late attrition. Then ſhall you draw forth the *Catheter*, firſt twineing it about, that ſo it may not ſcrape off the powder again. If intolerable pain hereupon happen, it ſhall bee aſſwaged, and the inflammation reſtrained by the following injection. R. *ſuccorum portulacæ, plantag. ſolani, & ſempervivi, an.* ℥ß. *album ovorum*, nu. vi. *agitentur diu in mortario plumbeo*; let it bee injected warm into the *urethra* with a ſyringe. In ſtead hereof you may alſo make uſe of another injection, which is formerly preſcribed. Neither will it bee unprofitable to applie repercuſſives to the genitals, to hinder pain and inflammation. You may alſo uſe other medicines, haveing a faculti'e to conſume the Caruncle, amongſt which theſe following are excellent.

A powder to waſte Caruncles.

How to applie it.

An injection to hinder inflammation.

An emplaſter uſed by the Surgeons of *Mountpelier* for Caruncles.

cellent. R. *viridis æris, auripigmenti, vitriol. Rom. aluminis rocb. an.* ℥ii. *infundantur omnia in acet. acerrimo, atque inter duo marmora in pollinem redigantur:* then let it bee expoſed to the ſummer's ſun, and dried, again infuſed in ſharp vineger, and then as before ground upon a marble, ſo that you finde nothing ſharp with your fingers; laſtly, let it bee oppoſed to the ſun until it may bee made into moſt ſubtil powder, and all the acrimonie bee vaniſhed, which will bee commonly in eight daies ſpace. Then, R. *ol. roſat.* ℥iv. *lythargyr.* ℥ii. *coquantur ad ignem, quouſque coierint in emplaſt. ſolidæ conſientiæ, ab igne tum ſemotis, adde pulv. prædict.* ℥ii. let them bee mixed with a ſpatula, and put it upon the fire until it com to ſo hard a conſiſtence, that it will ſtick faſt to a wax candle, or lead wier, ſo that it may not com off by handling with your hands. The Surgeons of *Montpelier* uſe this medicne: This following is another, R. *tutiæ præparat.* ℥vi. *antimonii,* ℥iii. *trochiſc. alborum, Rhaſ. camphorat.* ℥i. *corticis granati, aluminis uſti, an.* ℥iß. *ſpongiæ uſtæ,* ℈ii. let them bee all made iuto powder: then, R. *ung. diapompholigos, & alb. Rhaſis, an.* ℥ii. *miſceantur cum prædictis pulveribus in mortario plumbeo, & diu agitentur:* let a verie fine rag bee ſpread over with this ointment, and wrapped about a wax candle, and ſo thruſt into the *Vrethra*, and then draw forth the candle by twineing it a contrarie way; ſo let the end of the rag hang out of the yard, ſo to pluck ir forth again, when as you ſhall think it hath don what it can to the Caruncle, which is, when it hath covered it with the medicine with which it was ſpread. Som alſo make wax candles with a ſlender, but ſtiff wiek, whoſe end, which is to bee put to wear and conſume the Caruncle, is compoſed of the following medicine. R. *dmpl: ſtri nigri, vel diatbylonis irea i,* ℥ii. *pulv. ſabinæ, ocræ, viriol Rom. calcin. pul. mer. an.* ℥ß. *omnia liqueſcant ſimul ad dictum uſum.* Whil'ſt the cure ſhall bee in hand, by theſe following medicins; Let the patient bee careful that hee ſo ſhake hit yard after makeing water, that hee may ſhake forth all the reliques of the urine which may chance to ſtop at the Caruncles; for if but one drop ſhould ſtay there, it would bee ſufficient to ſpoil the whole operation of the applied medicines. After that the Caruncle ſhall bee worn awey and wholly conſumed by the deſcribed medicines, which you may know by the urine flowing forth freely, and in a full ſtream, and by thruſting up a *Catheter* into the bladder without anie ſtoppage; then it remain's that the ulcers bee dried and cicatrized; for which purpoſe the following injection is verie powerful and effectual, and without anie acrimonie. R. *aq. fabrorum,* ℔. ß. *nuc. cupreſ. gallar. cort. granat. an.* ℥iß. *alum. rocb.* ℥ß. *bulliant omnia ſimul ſecund. art.* ſo make a decoction for an injection, which you ſhall uſe ſo long, until no excrementitious humiditie diſtill out of the yard. The following powder drie's more powerfully, and conſequently haſten's forwards cicatrization, and it is alſo without acrimonie. R. *lapidem calamin. lotum, teſtas ovorum uſtas, coralium rubrum, corticem granat. comminue omnia in pollinem*; let this powder be uſed to the ulcers, with a wax candle joined to ſom *unguentum deſiccativum rubrum*, or ſom ſuch like thing. Alſo ſtrings or rods of lead thruſt into the *urethra* as thick as the paſſage will ſuffer, even to the ulcers, beeing firſt beſmeared with quickſilver, and kept in daie and night as long as the patient can endure, are good to bee uſed. For they drie by their touch and cicatrize, they dilate the urinarie paſſage without pain, and laſtly hinder the ſides of the ulcers from corrupting one another.

Another emplaſter.

How to applie it.

A caution in makeing water.

Signs that the Caruncle is worn away.

An epulotick injection.

Quick-ſilver by drying cauſeth cicatrization.

CHAP. XXIV.

Of venereal Buboes, *or ſwellings in the Groins.*

The efficient and material cauſes of venereous Bubo's.

THe virulencie of the *Lues Venerea* is ſomtimes communicated to the Liver, which if it have a powerful expulſive facultie, it expell's it into the groins, as the proper emunctories thereof, whence proceed venereal Buboes. The matter of theſe for the moſt part is abundance of cold, tough, and viſcous humors, as you may gather by the hardneſs and whiteneſs of the tumor, the pravitie of the pain, and contumacie of cureing; which alſo is another reaſon, beſides theſe that wee formerly mentioned, why the virulencie of this diſeaſ may bee thought commonly to faſten it ſelf in a phlegmatick humor. Yet ſomtimes venereal Buboes proceed from a hot, acrid and cholerick humor, aſſociated with great pain and heat, and which thereupon often degenerate into virulent and corroding ulcers. Som venereous Buboes are ſuch conjoined accidents of the *Lues Venerea*, that they foretel it; ſuch are theſe which for a ſmall while ſhew a manifeſt tumor, and ſuddenly, without anie manifeſt occaſion hide themſelvs again, and return back to the noble parts. Others are diſtinct from the *Lues Venerea* though they have a ſimilitude of eſſence and matter therewith, and which therefore may bee healed, the *Lues Venerea* yet remaining uncured. Such are theſe which are uſually ſeen, and which therefore compared with the former, may bee termed ſimple and not implicit. For the cure, you muſt not uſe diſcuſſing medicines, leſt reſolving the more ſubtil part, the groſſer dregs becom impact and concrete there; but much leſs muſt wee uſe repercuſſives, for that the matter is virulent. Wherefore onely attractive and ſuppurateing medicines are here to bee uſed, agreeable to the humor predominant and cauſing the the tumor, as more hot things in edematous and ſcirrhous tumors, then in thoſe which reſemble the nature of a *phlegmon* or *eryſipelas*: the indica-

What Bubo's foretel the *Lues venerea*

tion

tion taken from the raritie and denſitie of bodies inſinuate's the ſame varietie. The applying of cupping glaſſes is verie effectual to draw it forth. But when as it is drawn forth, you ſhall forthwith applie on emplaſtick medicine, and then you ſhall com to ſuppuratives. When the tumor is ripe it ſhall bee opened with a potential cauterie, if it peoceed from a cold cauſ; for by the inducing of heat the reſidue of the crude matter is more eaſily concocted; beſides when as an ulcer of this kinde is opened, the matter will bee more eaſily evacuated, neither ſhall it bee fit to uſe anie tent, but onely to applie pledgets. The reſidue of the cure ſhall bee performed by detergent medicines, and then if need require, the patient ſhall bee let blood, and the humors evacacuated by a purgeing medicine, but not before the perfect maturitie thereof.

Cupping.

A potential Cauterie.

CHAP. XXV.

Of the Exoſtoſis, *bunches or knots growing upon the bones by reaſon of the* Lues Venerea.

HArd tumors, *Exoſtoſes* and knots have their matter from thick and tough phlegm, which cannot bee diſſolved, unleſs by hot medicines, which have a mollifying and diſſolving facultie. For which purpoſe, beſides thoſe medicines which uſually are applied to ſcirrhous humors, you muſt alſo make uſe of *arg. viv.* commonly after this manner. R. *empl. filii Zach. & Ceronei, an.* ℥iii. *euphorb.* ℥ß. *emplaſt. de vigo,* ℥ii. *cerat. aſip. deſcript. Philagr.* ℥i. *argent. vivi extincti.* ℥vi. *fiat emplaſtrum.* Spread it upon leather for your uſe. In the mean ſpace let the patient obſerv a ſpareing diet; for thus hee ſhall bee helped, if ſo bee that the ſubſtance of the bones bee yet unperiſhed. For if it bee putrified and rotten, then deſcribed medicines are of no uſe, but you muſt of neceſſitie lay bare the bone, either by incition, or elſ by an actual or potential cauterie; but I had rather do it with an actual, for that it extract's the virulencie impact in the bones, as alſo it haſten's the abſceſs, or falling away of the corrupted bone. It ſhall bee of a convenient figure to cauterize the bone, as round, ſquare, or long. I uſually, before the application of ſuch a Cauſtick, firſt divide the fleſh that lie's over it with an inciſion-knife, that ſo the pain may bee the leſs, becauſ the fleſh cannot burn't through but in a long time, by which the fire may come to the bone. But it will not bee amiſs, before wee treat of this art, firſt to conſider the nature of the rottenneſs of the bones.

The matter of knots and virulent *Tophi*.

An emplaſter againſt the bunching out of the bones.

CHAP. XXVI.

Why the bones becom rotten, and by what ſigns it may bee perceived.

THat ſolution of Coutinuitie which is in the bones, is called by *Galen*, *Catagina*. This uſually is the cauſ of rottenneſs; for, bones that are grated, bruiſed, rent, perforated, broken, luxated, inflamed and deſpoiled of the fleſh and skin are eaſily corrupted; for diſpoiled of their covering, they are altered by the appulſ of the air, wch they formerly never felt, whence alſo their blood & proper nouriſhment is dried up & exhauſted. Beſides alſo, the *ſanies* running down by reaſon of wounds & old ulcers, in proceſs of time faſten's it ſelf into their ſubſtance, and putrefie's by little and little; this putrefaction is encreaſed and cauſed by the too much uſe of oilie and fattie medicines, as moiſt and ſuppurate things; for hence the ulcer becommeth more filthie and malign, the fleſh of the neighboring parts groweth hot, is turned into *pus*, which preſently falling upon the bone lying under it, inflame's it. Laſtly, the bones are ſubject to the ſame diſeaſes, as the fleſh that lieth under them is; beſides alſo according to *Galen*, the beginning of inflammation oftimes proceed's from the bones; but they beat not, becauſ, according to the opinion of the ancients, pulſation is a dolorifick motion of the Arteries, but the bones want ſenſ. Which verily I cannot denie, but alſo wee muſt confeſs that the membrane that encompaſſeth them, and the arteries that enter into their bodie, are endued with moſt exquiſite ſenſ. Wherefore the arteries compreſſed and waxing hot by reaſon of the inflamed bone, cauſ a ſenſ of pain in the *perioſtium*, ſo that the patients complain of a dull and deep pain, as it were ſunk into the ſubſtance of the bones. The rottenneſs or corruption is oftimes manifeſt to the eie, as when the bone is lai'd bare, for then it varieth from the natural color, and becom's livid, yellowiſh or black. Otherwiſe you may perceiv it by toueh, as by ſearching it with a probe, as when you meet with anie inequalitie or roughneſs, or when but gently touching it, your *probe* run's into the ſubſtance of the bone as into rotten wood; for a bone is naturally hard, but beeing rotten, becom's ſoft. Yet hardneſs is not an infallible ſign of a ſound bone. For I have ſeen rotten and bared bones, to have ſomtimes grown ſo hard, by the appulſ of the air, that a Trepan could not, without a ſtrong endeavor, enter them. Alſo the rottenneſs of the bone is known by the condition of the filth which flow's forth of the ulcer, for it is not onely more thin and liquid, but alſo more ſtinking. Furthermore, ſuch ulcers have a ſoft, looſ and waterie fleſh; beſides alſo, they are untoward and rebellious to ſarcotick

Gal. meth. 6.

The frequent cauſ of the rottenneſs of bones.

Hip. lib de ulc. fract.

Gal. lib. de tum. cont. nat.

Signs of the rottenneſs.

Hardneſs is no infallible ſign of ſound bones.

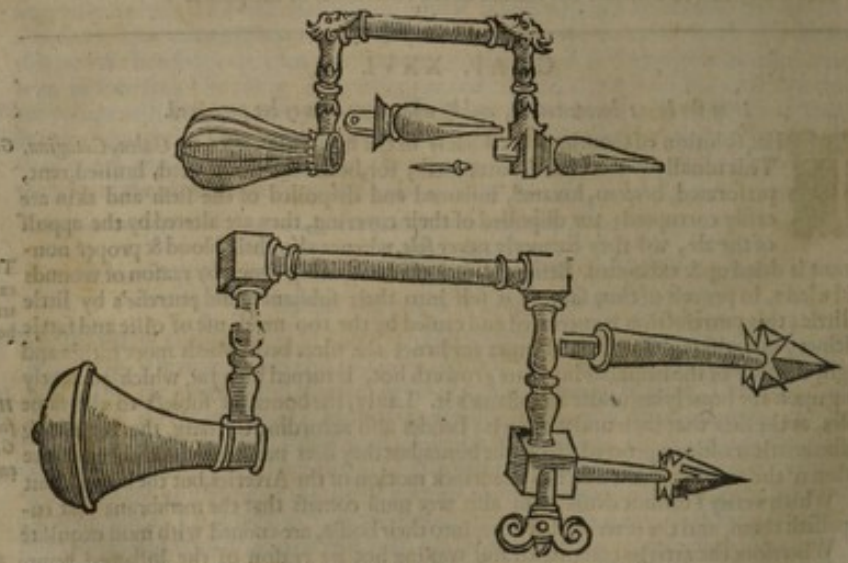
sarcotick and epulotick medicines; to which if they chance to yeeld and bee cicatrized, yet within a short while after the scar will relent of its own accord, for that nature, destitute of the firm and sound foundation of the bones, cannot build up a laudable and constant flesh. Neither is it sufficient that the Surgeon know certainly that the bone is rotten and corrupt, it is furthermore fit hee know, whether this corruption bee superficiarie, or pierce deep into the substance of the bone, that hee may know how much of the bone must bee scaled. For scaleing is the onely cure of that which is corrupted; now it is scaled by that which drie's exceedingly, & draw's forth all the humiditie, aswell the excrementitious, the autor of the rottennes, as the alimentarie. For thus it remain's without blood and nourishment, and consequently life also; whence it must of necessitie scale or fall off, beeing destitute of the glue or moisture which joined it to the sound parts in vicinitie and communion of life, like as leavs which fall away from the trees, the humiditie beeing exhausted, by which, as by glue, they adhered to the boughs. For this purpose Catagmatick powders are prepared to amend the corruption which is onely superficiarie. R. *pul. aloës, cretæ combustæ, pompholygos, an.* ʒii. *ireos flor. aristoloch. rot. myrrh. cerussæ, an.* ʒi. *pul. ostreor. combust.* ʒß. *teranter subtilissimè, fiat pulvis*; let it bee applied either alone by it self, or elf with honie and a little *aquæ vitæ*. Also the followiug emplaster beeing applied, stir'sup nature to the exclusion of the broken bones, and cleanseth the ulcers from the more gross and viscid *sanies*. R. *cer. nov. res. pini, gum. ammon. & elemi, an.* ʒvi. *tereb.* ʒiii. *pul. mastich. myrrh. an.* ʒß. *aristol rot. ireos flor. aloës, opopan. euphorb. an.* ʒi. *olei rosati quantum sufficit, fiat emplast. secundum artem. Euphorbium*, according to *Dioscorides* take's off the scales of bones in one daie. Hereto also conduceth *Emp. de betonicâ*. Or, R. *olei caryophyl.* ʒß. *camph.* ʒii. *misceantur simul in mortario, & utere*. But if that part of the bone which is corrupt cannot thus bee taken away, then must you use the scaleing Trepans and Scrapers described formerly in wounds of the head; especially if anie more great or solid bone bee foul. Furthermore the here-described Trepan will bee good to perforate the rotten bone in manie places where it is corrupted, until, as it were, a certain bloodie moisture issue forth at the holes; for thus it more freely enjoie's the air, and also the force of the medicines admitted by these holes work's more powerfully.

The cure of a rotten bone.

A catagmatick powder.

A desquamatorie or scaleing plaster. *Dioscor. lib. 3. cap.* 78.

A Trepan with two triangular bits and a pin to hold them in the stock: as also another Trepan haveing four-square and six-quare bits convenient for to bee used in the rottennes of greater bones.



But if the rottennes bee more deep, and the bone more hard, either by nature or accident, as by the occasion of the too long admission of the air, then the rotten scales shall bee cut off by the instruments described in wounds of the head, driveing them into the bone with leaden mallets, lest the part should bee too much offended or shaken with the blow. The scales and fragments shall bee taken forth with mullets, the signs that all the rottennes is taken away, are the solidnes of the bone thereunder, and the bloodie moisture sweating out thereat.

Signs that the rottennes is taken away.

CHAP.

CHAP. XXVII.

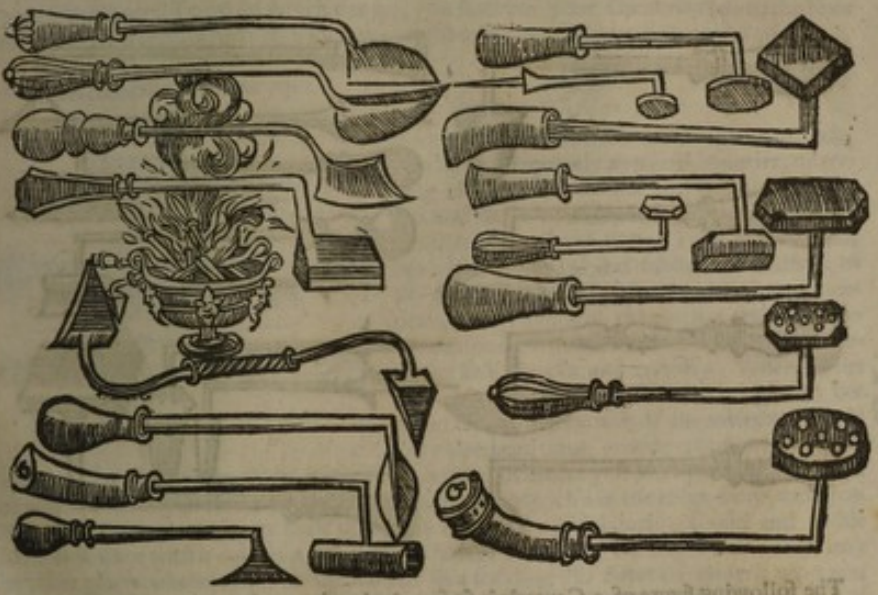
Of actual and potential Cauteries.

BUt if the described remedies cannot take place, by reason of the malignitie or magnitude of the rottennes, then must wee com to actual and potential Cauteries. But I should rather approov of actual, becaus by strengthening the part, they consume the excrementitious humors wherewith it is over-charged, to wit, the matter of the *Caries*; which is not so effectually performed by potential Cauteries. Yet are wee oftimes forced to use these, to pleas the patients which are terrified at, and affraid of hot irons. Potential Cauteries are *aqua fortis*, *aqua vitrioli*, scalding oil, melted sulphur and boiling, and the like; in pouring on of which I would have the Surgeon to bee prudent and industrious, lest hee should rashly violate the neighboring sound parts by the burning touch of these things; which his temeritie would caus vehement pains, inflammations, and other horrid symptoms. For actual Cauteries, their varietie in figure is so great, that it cannot bee defined, much less set down in writeing; for they must bee varied according to the largeness of the rottennes, and the figure and conformation of the fouled bones. Such as are more usual I have thought good here to delineate unto you, content onely to admonish you thus much, that som of these work by pricking, som by cutting, som flat-wise, and other-som with their points made to the form of an Olive-leaf.

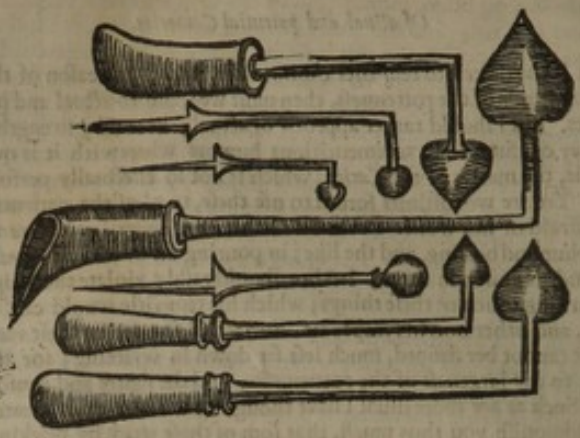
Actual Cauteries to bee preferred before potential.

Potential Cauteries.

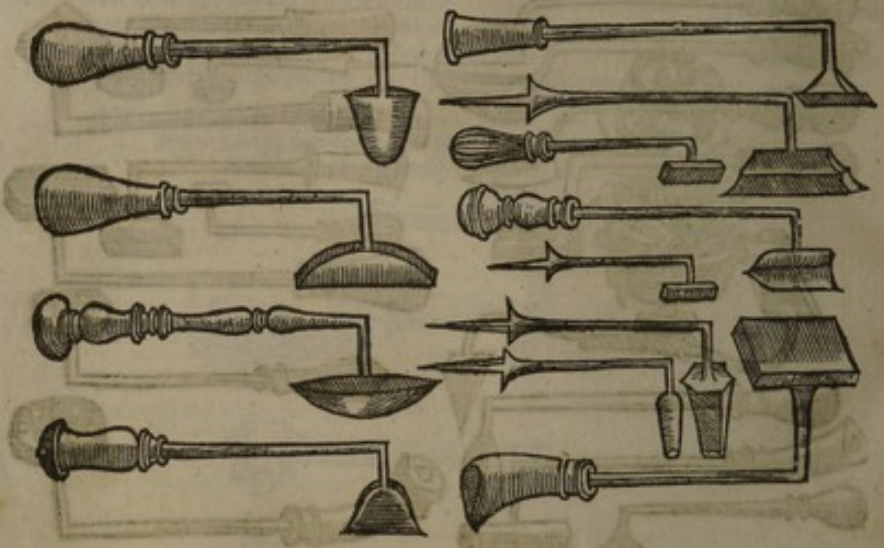
Sundrie forms of actual Cauteries fit in all necessarie cases of all parts.



Other Cauteries.



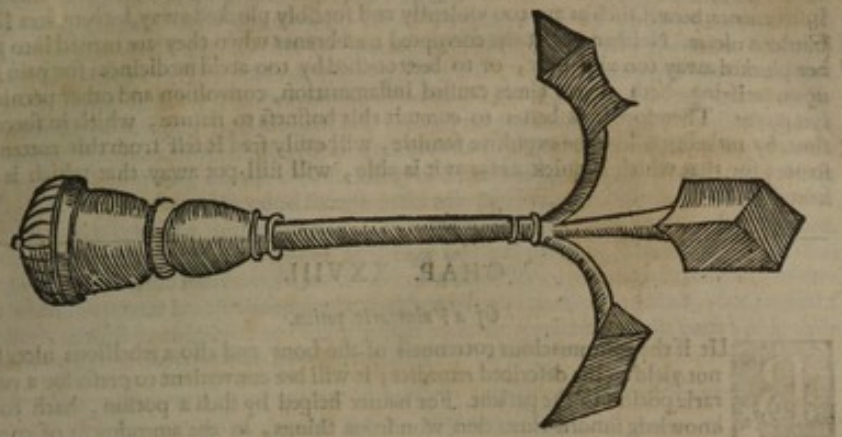
Other Cauteries for the ſame purpoſe.



The following figure of a Cauterie is fit for virulent knots that ariſe in the ſcull, when you deſire to take away the fleſh that cover's the bone; for this purpoſe it is made hollow and ſharp in a triangular and quadrangular form, divided as it were into three branches, that you may ſo make uſe of which you pleaſ.

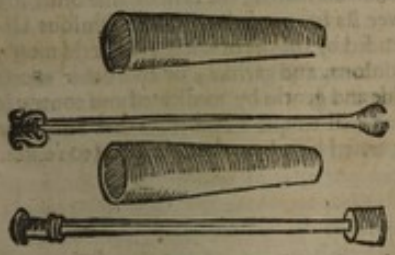
The

The figure of an hollow and cuting Cauterie.



The Cauteries, whose forms are hereafter expresst, take place in rotten bones that lie deep in, wherein you cannot make use of the formerly described, without touching of the neighboring sound parts. To avoid which danger, you shall put your Cauterie even to the bone through an iron pipe, which may keep the neighboring and fleshie parts from burning.

Actual Cauteries with their pipes.



Great discommodities ensue upon too rash, that is, too frequently applied Cauteries, or too long adhering to the bone; for by this immoderate and fierie heat not onely the excrementitious humiditie of the rotten bone is consumed, but also the radical and substantial moisture of the part is exhausted; wherein alone nature endeavouring to cast off the corrupt scales, and sever the sound from the rotten bone, and to substitute flesh, stand's and consist's. Whereof, the measure of applying of Cauteries ought to bee taken from the greatness of the rottenness, and the excrementitious, or after a manner, foaming humiditie sweating through the pores of the bone. But before you press your Cauterie into the rotten bone which lie's verie deep in, as that which happen's in the thigh-bone, and upon other verie fleshie parts, you must diligently defend the neighboring sound and fleshie part, as it were with a covering, for that the humor diffused by the touch of the fire, burn's the other places whereunto it diffuseth it self like scalding oil. After the cauterization, you must help forwards the falling away of the scales, by somtimes dropping in our oil of whelps, beeing made scalding hot. This oil, though verie fit for this purpose, yet do I not judge it fit to use it too often, it may suffice to have dropped it in, som twice or thrice. For at length it may violate the sound bone, that lie's under the rotten, by the oilie, subtil and moist substance. Furthermore, a bone is the most drie part of the bodie, therefore unctuous and moist medicines are contrarie to its temper and consistence. But it conduceth often and gently to moov the scales alreadie beginning to separate themselvs, and it hasten's the slackness of nature in casting them off. Yet may you not use force, unless peradventure when as they hang as it were by a slender thred; otherwise if the unwarie Surgeon forcibly pluck away the scales before that nature hath put a cover upon the sound bone, hee shall give way to a new alteration and fowlness by the appulf of the air. Furthermore, after the corrupt scale is falling off by the force of nature expelling it, you must have diligent heed that you put not eating or corroding medicines upon the bone that is under it; for thus thou shalt consume or waste the flesh which nature hath generated thereupon, which composed of newly concreted blood, is like in softness to newly crudled milk, which otherwise in time would grow into a more solid and hard consistence. This under-growing flesh by little and little thrust's the rotten bone above it, out of its place, and is the caus of the scaling thereof; it is at the first gathered together like the grains of a pomegranate, with a red, smooth & equal *sanies*, and not stinking, and at length it cast's forth a white matter. Therefore then wee must rather straw thereon cephalick powder composed of such things as have a faculte to

Manner of applying of Cauteries.

Oil of whelps help's forwards the casting off of scales.

A caution in mooving the scales of burnt bones.

Cephalick powders of what composed.

to drie without biteing, such as are Orris-roots, washed aloës, mastich, myrrh, barlie-flowr, and the like. Lastly, it must bee cicatrized; it is better that scales of bones fall away of themselvs by the onely force of nature, then to bee plucked away by the force of medicines or instruments; becaus, such as are too violently and forcibly plucked away, leav corners like to fistulous ulcers. Neither ought the corrupted membranes when they are turned into *pus* to bee plucked away too violently, or to bee touched by too acrid medicines; for pain hereupon arising hath divers times caussed inflammation, convulsion and other pernicious symptoms. Therefore it is better to commit this business to nature, which in succes of time, by makeing use of the expulsive facultie, will easily free it self from this rotten substance; for that which is quick as far as it is able, will still put away that which is dead from it.

CHAP. XXVIII.

Of a Vulnerarie potion.

BUt if the contumacious rottennes of the bone, and also a rebellious ulcer shall not yield to the described remedies, it will bee convenient to prescribe a vulnerarie potion to the patient. For nature helped by such a potion, hath to my knowledg sundrie times don wondrous things, in the amendment of corrupt bones, and consolidation of ulcers. For these potions though they do not purge the noxious humors away by stool, yet are they wondrous effectual to cleans ulcers, and free them from the excess of excrementitious humors, to cleans the blood, and purge it from all impuritie, to agglutinate broken bones, and knit the sinews. I have here thought good to speak of them, and chiefly, for that they were much commended by the Antients, but neglected by the modern Physicians and Surgeons. But if the cure of wounds and old ulcers bee performed by detersion, and the reposition of the lost substance, what medicine can sooner or rather do it then that, which by its admirable and almost divine force so purgeth the blood, that thereof, as from a fit and laudable matter, the flesh or anie other lost substance may bee fitly restored, and the part recover its former union? But if fistulous Ulcers, Cancers, Gouts, and the like diseases bee offended by the use of salt, spiced, acrid meats, and others which are of subtil parts, as mustard, onions, and garlike, or anie other excess in meat or drink; why may they not becom milde and gentle by medicated and contrarie meats and drinks, or at least bee redneed to a more equal temper? Therefore that Surgeons may know of what things such compositions may arise, I have here thought good to reckon them up, that you may learn what they are.

The use of vulnerarie potions.

Scabious.	*The Capillaries.*
Sanicle.	*Herb-Robert.*
Bugle.	*Dove's-foot.*
Mous-ear.	*Dog's-tongue.*
Burnet.	*Avenes.*
Madder.	*Prunella.*
Tansie.	*Osmund.*
Tops of hemp.	*Clarie.*
Tops of brambles.	*Gentian.*
Sow's-bread.	*Herniaria.*
Comforie the greater and lesser.	*Red Cole-wurt, or Cabbage.*
Vervine.	*Scordium.*
Bistort.	*Cat's-mint.*
Mug-wurt.	*Cinque-foil.*
Periwincle.	*River-Crabs.*
Centaurie.	*Mace.*
Adder's-tongue.	*Bole-armenick.*
Betonie.	*Petum, or Tobacco*
Carduus benedictus.	*Mead-sweet.*
The cordial flowers.	*Colt's-foot.*
Aristolochia, or Birth-wurts.	*Dandelion.*
Speed-well.	*Plantane.*
Agrimonie.	*S. John's-wurt.*

Of all these the Surgeon shall make choice according to the minde and judgment of the Physician, such as hee shall think fit and proper to everie ulcer or wound, or to each wounded and ulcerated part, according to the condition of the time, the temper of the patient, and kinde or nature of the diseas. You may make drinks not onely of the decoctions of these, but also of their juices in white wine, or *anomel*, which are good not onely to purifie the

the mats of the blood, to cleanſ ſanious, virulent, filthie and dyſſenterious ulcers, but alſo to drive away putrefaction, ſcale-bones, diſſolv clotted blood in bruiſes, to draw, pluck out and exterminate all ſtrange bodies, as I have often obſerved to my great admiration. They are compoſed uſually after this manner. R. *ſatvic. bugul. ſcabioſ. beton. ſcord. nepet. an.* m.ß. *uvar. mund. ſem. hyper. & card. ben. an.* ℥i. *trium flor. cord. an.* p.ii. *coquantur completè in aq. communi; poſtea in fine adde vini alb. mel. roſ. & cinnam. quod ſufficit, fiat decoctio, colatur per manicam.* Let him drink ℥iii. in the morning 3. hours before dinner. You may alſo with good ſucceſs make injections with the ſame liquor into fiſtulous and ſinuous ulcers, as alſo to waſh the ſordid ulcers therewith. You may alſo boil the ſame ſimples, as herbs, flowers and ſeeds in the patient's broths, that ſo they may acquire a medicinable and nouriſhing facultie. For the time of the affect, wherein you may with good ſucceſs make uſe of theſe, wee have read in *Guido*, that hee uſed not to preſcribe theſe potions to his patients when as they were newly wounded, for that they commonly are compoſed of things hot and opening, which heat and attenuate the blood, whence there would bee danger of a defluxion, upon the affected part. Wherefore when the matter is com to ſuppuration, when as there nothing remain's, but to cleanſ the ulcer, and fill it with fleſh, no inflammation as now remaining in the part, I judg theſe potions may then bee uſed with good ſucceſs.

The form of a vulnerarie potion.

In what time of the diſeaſ they are chiefly to bee uſed.

CHAP. XXIX.

Of Tetters, Ring-worms, or Chops occaſioned by the Lues Venerea.

UPon the cure of the *Lues Venerea*, uſually Tetters and Chops happen thereupon, which make furrows in the palms of the hands and ſoles of the feet. They acquire their matter from ſalt phlegm, or aduſt choler, or the reliques of the venereous virulencie ſent thither. The cure, eſpecially when as the diſeaſ is grown old, is difficult; by reaſon that the humor hath long accuſtomed to flow that way, and for that it hath corrupted the habit of the part by the continual defluxion; but the cure is more eaſie, if the diſeaſ bee newly bred. Now you may know it is newly bred by the redneſs, accompanied by a great itching, and not onely a drineſs of the skin, but alſo a thickneſs and denſneſs thereof. That which is old, beſides theſe fore-recited ſigns, have ſcalie and bran-like hardneſſes conjoyned therewith, which by ſcratching and rubbing caſt off ſcales. For general medicines, the diſtemper of the liver, and habit of the bodie muſt bee corrected, which by the occaſion of the former diſeaſ and remedies apt to inflame the blood, cannot but much ſwerv from their native temper. This may bee don by diet conveniently appointed, by purgeing and altering medicines, bleeding, batheing, applying of cupping-glaſſes and horns. For topick or particular medicines, waſh ſuch as are newly or lately bred with the following water which drie's and is of ſubtil parts. R. *aq. roſ. & pariet. an.* ℥i. *aq. alum.* ℥ii. *calc.* ℥ii. *alum.* ℥iii. *pul. ſubl.* ℈iv. *fiat lent. & minim. ebul. in baln. mar.* This water ſhall bee made more or leſs forcible, according to the condition of the diſeaſ. Or, R. *ol. tart.* ℥ii. *ſep. com.* ℥iv. *miſc. fiat unguent. ad uſum.* If the Phyſician ſhall think good, let the patient uſe a decoction of *Guaicum*, but that verie weak. But old Tetters and Chops muſt bee ſoftned with emollient, attenuating and inciding decoctions, as alſo with liniments, ointments and plaſters haveing the ſame effect. Then let the reſidue of the cure bee performed by fumigations, ſuch as this which follow's. R. *pul. cinab* ℥ii. *lad. aſſ. odor. ſtirac. cal. an.* ℥ß. *olib. maſtic. an.* ℥iii. *olei tart. & theriac. q. ſ. fiant trochiſci*; uſe at each time ſom ℥ß. of them, and let onely the affected parts receiv the ſmoak. Som commend the rubbing of the hands with the following medicine. Take the aſhes of wine-lees, make thereof a lee, and ſtrain it through an hypocraſs-bag, then put thereto ſom rennet, let them bee well mixed together in a mortar, and herewith let the hands bee rubbed or waſhed. Or, R. *unguent. enul.* ℥iii. *fugit.* ℥ii. Or elſ, R. *reſ. pini*, ℥i. *ceruſ.* ℥ß. *argent. viv.* ℥iii. *ſucci citri & lapath. acut. an.* ℥ß. Let them bee incorporated, and make a liniment to bee uſed to the part. If to this you add *ſublimate* ſo waſhed and prepared, as women uſe for their faces, you ſhall make it more effectuall. Others take burnt alum made into powder, and incorporated with the yolk of an egg, the juice of citrons, and a little aloes diſſolved in *oxymel ſcilliticum*.

Signs of the new-bred diſeaſ.

The cure of newly com Tetters.

A water drying virulent Tetters.

The cure of old Tetters.

A Fumigation.

A Liniment.

CHAP. XXX.

Of cureing the Lues Venerea *in infants and little children.*

INfants oftimes conceiv the ſeeds of this diſeaſ in the wombs of their mothers, and are born infected there-withall, puſtles preſently ariſeing over all the bodies, infecting with the like diſeaſ as manie nurſes as give them ſuck; they ſcarce ever recover thereof, for that they contracted the diſeaſ from their firſt confirmation. But ſuch as are ſomwhat bigger, if they chance to catch the diſeaſ after they are born by ſucking ſom infected nurſ, or by anie other occaſion or kinde of contagion, often times receiv cure.

The cure.

For first, you shall caus the nurs to use the *aqua theriacalis* here-under described, for the space of twentie or more daies, that so shee may the better arm her self against the contagion of this diseas, and yield milk which may have the facultie both of meat and medicine; shee shall bee careful as often as shee giv's the childe suck, to wash and drie her teat or pap, lest the virulencie that the childe breath'es out at his mouth, bee impact in the little holes of the teat through which the milk flow's out. Now the pustles of little children shall bee annointed with som ointment that receive's *argentum vivum* in som small quantitie, as *unguentum enulatum cum mercurio*, or the like. Then shall it bee swathed or bound up in swathes and clothes aired with the formerly described fumigations. For the rest, it shall bee kept as warm as you can in som warm place. These and the like must bee don not in one continued cours, but at several seasons, otherwise it is to bee feared, that it would caus ulcers to arise in the mouth, or els salivation. If anie ulcers arise in the mouth, and spread therein, they shall bee touched with the formerly described waters, but made somwhat weaker, haveing regard to the tender age of the patient; if the infant shall get this diseas of its nurs, let the nurs bee presently changed, for it beeing otherwise nourished with tainted and virulent blood, can never bee healed. Manie have by these means recovered; but such as have perish't, have not perish't by the default of medicines, but by the malignitie and vehemencie of the diseas.

A description of the Aqua Theriacalis, *or treacle-water formerly mentioned.*

A treacle-water.

℞. *rasor. interior. ligni sancti gummosi*, ℔ii. *polypod. querni*, ℥iv. *vini albi dulcedinis expertis* ℔ii. *aquæ fontan. puriss.* ℔viii. *aquar. cichor. & fumar. an.* ℥iv. *sem. junip. heder. & baccar. lauri an.* ℥ii. *caryophyl. & macis, an.* ℥ß. *cort. citri saccaro condit. cons. ros. anthos, cichor. buglos. borag. an.* ℥ß. *cons. ænulæ camp. theriac. vet. & mithrid. an.* ℥ii. distil them all in *balneo Mariæ*, after the following manner.

The manner of makeing it.

Let the *Guaicum* bee infused in equal parts of wine, and the fore-mentioned waters for the space of twelv hours, and the residue of the things in that which remain's of the same wine and waters for six hours space, beating such things as may require it, then let them bee mixed altogether, that so the liquor may bee endued with all their faculties. Which that it may bee the more effectually performed, let them bee boiled, put up in glass-bottles, closely stopped for som three or four hours space, in a large kettle filled with boiling water, then let them bee put into a glass alembick, and so distilled. Give ℥iv. of this distilled liquor at once, beeing aromatized with ʒi. of cinnamon, and ℈i. of *Diamargariton*, and ℥ß. of sugar, to give it a pleasing taste. Such a drink doth not onely retund the virulencie of the *Lues Venerea*, but strengthen's the noble parts. *Rondeletius* make's an *aqua theriacalis* after this manner.

Rondeletius his treacle-water.

℞. *theriac. vet.* ℔i *acetos.* m. iii. *rad gram.* ℥iii. *puleg. card. ben. an.* m. ii. *flor. chamæm.* p. ii. *temperentur omnia in vino albo, & distillentur in vase vitrio*: reserv the water for use; whereof let the patient take ℥ii. with ℥iii. of sorrel and bugloss-water: hee wisheth this to bee don when hee shall enter into bed or a stove; for so this distilled liquor will caus sweat more easily, and mitigate pain, whether given by it self, or with a decoction of grommel, or of *chyna*, or burdock-roots; yet if the patient bee of a phlegmatick constitution, hee shall use a decoction of *Guaicum* in stead of a decoction of *chyna*, for it penetrate's more speedily, by reason of its subtiltie of parts, and also expell's the dolorifick matter.

The end of the nineteenth Book.

Of the *Small Pocks* and *Meazles*: As alſo of *Worms*, and the *Leproſie*.

The twentieth Book.

CHAP. I.

Of the cauſes of the Small Pocks and Meazles.

FOR that the ſmall Pocks and Meazles are diſeaſes, which uſually are fore-runners and fore-tellers of the Plague, not onely by the corruption of humors, but oftimes by default of the air; moreover, for that worms are oft-times generated in the plague, I have thought good to write of theſe things, to the end that by this treatiſe the young Surgeon may bee more amply and perfectly inſtructed in that peſtilent diſeaſ. Alſo I have thought good to treat of the Leproſie as beeing the off-ſpring of the higheſt corruption of humors in the bodie. Now the ſmall Pocks are puſtles, and the Meazles ſpots, which ariſe in the top of the skin by reaſon of the impuritie of the corrupt blood ſent thither by the force of nature. Moſt of the Antients have delivered that this impuritie is the reliques of the menſtruous blood remaining in the bodie of the infant, beeing of that matter from whence it drew nouriſhment in the womb, which lying ſtill or quiet for ſom ſpace of time, but ſtirred up at the firſt opportunitie of a hotter Summer, or a ſoutherlie or rainie ſeaſon, or a hidden malignitie in the air, and boiling up, or working with the whole maſs of the blood, ſpread or ſhew themſelvs upon the whole ſurface of the bodie. An argument hereof is, there are few or none who have not been troubled with this diſeaſ, at leaſt once in their lives, which when it begin's to ſhew it ſelf, not content to ſet upon ſom one, it commonly ſeazeth upon more: now commonly there is as much difference between the ſmall pocks and meazles, as there is between a Carbuncle and a peſtilent *Bubo*. For the ſmall pocks ariſe of a more groſs and viſcous matter, to wit, of a phlegmatick humor. But the meazles of a more ſubtil and hot; that is, a cholerick matter, therefore this yeeld's no marks thereof, but certain ſmall ſpots without anie tumor, and theſe either red, purple, or black. But the ſmall pocks are extuberateing puſtles, white in the mid'ſt, but red in the circumference, an argument of blood mixed with choler, yet they are ſcarce known at the beginning, that is on the firſt or ſecond daie they appear; but on the third and fourth daie they bunch out and riſe up into a tumor, becomming white before they turn into a ſcab; but the meazles remain ſtill the ſame. Furthermore the ſmall pocks prick like needles by reaſon of a certain acrimonie, and cauſ an itching; the meazles do neither, either becauſ the matter is not ſo acrid and biteing, or elſ for that it is more ſubtil, it eaſily exhale's, neither is it kept ſhut up under the skin. The patients often ſneez when as theſe matters ſeek paſſage out, by reaſon of the putrid vapors aſcending from the lower parts upwards to the brain. They are held with a continual Fever, with pains in their backs, itching of their noſe, head-ach, and a vertiginous heavineſs, and with a kinde of ſwounding or fainting, a nauſeous diſpoſition, and vomiting, a hoarſneſs, difficult and frequent breathing, an inclination to ſleep, a heavineſs of all the members, their eies are fierie and ſwollen, their urine red and troubled. For prognoſticks, wee may truely ſay thus much, That the matter whence this affect take's its original, partake's of ſo malign, peſtilent and contagious a qualitie, that not content to mangle and ſpoil the fleſhie part, it alſo eat's and corrupt's the bones like the *Lues Venerea*, as I obſerved not onely in *Anno Dom.* 1568. but alſo in diverſ other yeers, whereof I think it not amiſs to ſet down this notable example.

What the ſmal Pocks and Meazles are. Their matter.

Why the Meazles do not itch.

Prognoſticks.

The daughter of *Claude Piqué* a book-ſeller, dwelling in S. *James* his ſtreet at *Paris*, beeing ſom four or five yeers old, haveing been ſick of the ſmall pocks for the ſpace of a month, and nature could not overcom the malignitie of the diſeaſ, there roſe abſceſſes upon the *ſternon* and the joints of the ſhoulders, whoſe eating and virulent matter, corroded the bones of the *ſternon*, and divided them in ſunder; alſo it conſumed a great part of the top of the ſhoulder-bone, and the head of the blade-bone: of this thing I had witneſſes with me, *Marcus Myron* Phyſician of *Paris*, and at this preſent the King's chief Phyſician, *John Doreau* Surgeon to the *Conte de Bryane*, the bodie being diſſected in their preſence. Alſo you may obſerv in manie killed by the malignitie of this diſeaſ, and diſſected, that it cauſeth ſuch impreſſion of corruption

An hiſtorie.

What grievous and pernitious symptoms may happen by the small Pocks.

ruption in the principall parts, as bring's the dropſie, ptiſick, a hoarſneſs, *Aſthma*, bloody flux ulcerating the guts, and at length bringing death, as the puſtles have raged or raigned over theſe or theſe entrails, as you ſee them to do over the ſurface of the body; for they do not onely moleſt the external parts, by leaving the impreſſions & ſcars of the puſtles and ulcers, rooting themſelvs deep in the fleſh, but alſo oft times they take away the faculti of motion, eating aſunder, and weakning the joints of the elbow, wreſt, knee and ancle. Moreover ſundry have been deprived of their ſight by them, as the Lord *Guymenay*, others have loſt their hearing, and otherſom their ſmelling, a fleſhy excreſcence growing in the paſſages of the noſe and ears. But if anie reliques of the diſeaſ remain, and that the whole matter thereof bee not expelled by the ſtrength of nature, then ſymptoms afterwards ariſe, which favor of the malignitie of the humor, yea and equall the harm of the ſymptoms of the *Lues Venerea*.

CHAP. II.

Of the cure of the Small Pocks and Meazles.

The cure.

THe cure of this diſeaſ uſeth to bee divers, according to the condition of the humor free from, or partaker of the venenate qualitie. For if it partake of malignitie, and the childe bee a ſucking childe, ſuch things ſhall bee given to the Nurſ as may infringe and overcom the ſtrength of the malignitie, as wee ſhall ſhew more at large, when wee com to treat of the cure of children which are ſick of the Plague; howſoever it bee, the childe muſt bee kept in a warm room free from winde, and muſt be wrapped and covered with ſcarlet cloaths, untill the pocks com forth. There ſhall bee provided for the Nurſ medicated broths with purſlain, lettuce, ſorrell, ſuccory, borage, and French barly bound up in a cloth. Shee ſhall ſhun all ſalt, ſpiced and baked meats, and in ſtead of wine drink a decoction of liquorice, raiſons and ſorrel roots. Shee ſhall alſo take purgeing medicins, as if ſhee were ſick of the ſame diſeaſ, that ſo her milk may becom medicinable. Laſtly, ſhee ſhall obſerv the ſame diet as is uſually preſcribed to ſuch as have the plague. You ſhall give the childe no pap, or if you give it anie, let it be verie little. But if the childe bee weaned, let him abſtain from fleſh, untill the feaver have left him, and the pocks bee fully com forth: in ſtead of fleſh let him feed on barly and almond creames, chicken broths, wherein the fore-named herbs have been boyled, panadoes, gellies, culaſſes, prunes and raiſons. Let his drink bee a ptiſan made of French barlie, graſs & ſorrel roots, or with a nodula containing the four cold ſeeds, the pulp of prunes and raiſons, with the ſhaveings of Ivorie and hartſ-horn; between meals the ſame decoction may bee mixed with ſom ſyrup of violets, but not of roſes or any other aſtringent ſyrup, leſt wee hinder the couſ and inclination of the humor outwards.

The childe muſt have no pap.

How ſound ſleep doth harm in this diſeaſ.

Let his ſleep bee moderate, for too ſound ſleep draws back the matter to the center, and increaſeth the fever; you muſt neither purge, nor draw blood the diſeaſ increaſing or beeing at the height, unleſs paradventure there bee a great plenitude, or elſe the diſeaſ complicate with other, as with a pleuriſie, inflammation of the eyes, or an ſquinancie which require it, leſt the motion of nature ſhould be diſturbed; but you ſhall think it ſufficient to looſe the bellie with a gentle glyſter: but when the height of the diſeaſ is over, and in the declenſion thereof, you may with *Caſſia* or ſom ſtronger medicine evacuate part of the humors and the reliques of the diſeaſ. But in the ſtate and increaſ it is better to uſe ſudoriſicks, which by attenuating the humors and relaxing the pores of the skin may drive the cauſ of the diſeaſ fom the center to the circumference, which otherwiſe refideing in the bodie might bee a cauſ of death; as I and *Richard Hubert* obſerved in two maids, whereof one was four, and the other ſeventeen yeers old; for wee diſſecting them both beeing dead, found their entrails covered with ſcabbie or cruſted puſtles, like thoſe that break forth upon the skin. Wee muſt not think that a bleeding at noſe at the beginning of the diſeaſ, or in the firſt four or five daies ſhould carrie away the matter and original of the diſeaſ, for nevertheleſs the pocks will com forth; but for that this is a true and natural *criſis* of this diſeaſ, as that which is carried to the ſurface & circumference of the bodie, ſuch bleeding muſt not be ſtopped, unleſs you fear it will cauſ ſwounding. The matter ſhall bee drawn out with a decoction of figs, husked lentils, citron-ſeeds, the ſeeds of fennel, parſlie, ſmallage, roots of graſs, raiſons and dates. For ſuch a decoction, certainly if it have power to cauſ ſweat, hath alſo a facultie to ſend forth unto the skin the morbifick humor; the ſeeds of fennel and the like opening things relax and open the pores of the skin; figs lenifie the acrimonie of the matter, and gently cleanſ, the lentils keep the jaws and throat, and all the inward parts from puſtles, and hinder a flux by reaſon of their moderate aſtriction, but haveing their husks on, they would binde more then is required in the diſeaſ; dates are thought to comfort the ſtomach, and citron-ſeeds to defend the heart from malignitie, licoriſh to ſmooth the throat, and hinder hoarſneſs and cauſ ſweat. But theſe things ſhall bee given long after meat, for it is not fit to ſweat preſently after meat; ſom there bee who would have the childe wrapped in linnen clothes ſteep'd in this decoction beeing hot, and afterwards hard wrung forth. Yet I had rather

Of purgeing, bleeding and ſudoriſicks

An hiſtorie.

A ſudorifick decoction.

When it is beſt to procure ſweat.

rather to use bladders or spunges, or hot bricks for the same purpose; certainly a decoction of millet, figs and raisons, with som sugar, causeth sweat powerfully. Neither is it amiss whil'st the patient is covered in all other parts of the bodie, and sweat's, to fan his face, for thus the native heat is kept in and so strengthned, and fainting hindred, and a greater excretion of excrementitious humors caused. To which purpose you may also put now and then to the patient's nose a *nodulus* made with a little vineger and water of roses, camphire, the powder of sanders, and other odoriferous things which have a cooling facultie, this also will keep the nose from pustles.

CHAP. III.

What parts must bee armed against, and preserved from the Pocks.

THe eies, nose, throat, lungs and inward parts ought to bee kept free'r from the eruption of pustles then the other parts; for that their nature and consistence is more obnoxious to the malignitie of this virulencie, and they are easilyer corrupted and blemished. Therefore lest the eies should bee hurt, you must defend them when you first begin to suspect the disease, with the eie-lids, also moistning them with rose-water, verjuice or vineger, and a little camphire. There are som also who for this purpose also make a decoction of Sumach, berberie-seeds, pomgranate-pills, aloës, and a little saffron; the juice of sowr pomgranates, and the water of the whites of eggs dropped in with rose-water are good for the same purpose; also woman's milk mixed with rose-water and often renewed; and lastly all such things or have a repercussive qualitie. Yet if the eies bee much swoln and red, you shall not use repercussives alone, but mix therewith discussers and cleansers, such as are fit by a familaritie of nature to strengthen the sight; and let these bee tempered with som fennel or eie-bright water. Then the patient shall not look upon the light or red things for fear of pain and inflammation; wherefore in the state of the disease, when the pain and inflammation of the eies are at their height, gently drying and discussive things properly conduceing to the eies are most convenient, as washed aloës, tuttie and Antimonie in the water of fennel, eie-bright and roses. The formerly mentioned *nodulus* will preserv the nose, and linnen clothes dipped in the fore-said astringent decoction, put into the nostrils and outwardly applied. Wee shall defend the jaws, throat, and throtle, and preserv the integritie of the voice by a gargle of oxycrate, or the juice of sowr pomgranates, holding also the grains of them in their mouths, and often rouling them up and down therein, as also by nodula's of the seeds of *ysilium*, quinces and the like cold and astringent things. Wee must provide for the lungs and respiration by syrups of jubes, violets, roses, white poppies, pomgranates, water-lillies, and the like. Now when as the Pocks are throughly com forth, then may you permit the patient to use somwhat a free'r diet, and you must wholly busie your self in ripening and evacuateing the matter, drying and scaleing them. But for the Meazles, they are cured by resolution onely, and not by suppuration; the Pocks may bee ripened by annointing them with fresh butter, by fomenting them with a decoction of the roots of mallows, lillies, figs, line-seeds and the like. After they are ripe, they shall have their heads clipped off with a pair of sciffers, or elf bee opened with a golden or silver-needle, lest the matter contained in them, should corrode the flesh that lie's thereunder, and after the cure, leav the prints or pock-holes behinde it, which would causs som deformitie; the *pus*, or matter beeing evacuated, they shall bee dried up with *unguent. rosat.* adding thereto ceruss, litharge, aloës and a little saffron in powder; for these have not onely a facultie to drie, but also to regenerate flesh; for the same purpose the flowr of barlie and lupines are dissolved and mixed with rose-water, and the affected parts annointed therewith with a fine linnen rag; som annoint them with the sward of bacon boiled in water and wine, then presently strow upon them the flowr of barlie or lupines, or both of them. Others mix crude honie newly taken from the comb, with barlie-flowr, and therewithall annoint the pustles so to drie them; beeing dried up like a scurf or scab, they annoint them with oil of roses, violets, almonds, or elf with som cream, that they may the sooner fall away, the pustles beeing broken; tedious itchings sollicit the patients to scratch, whence happen's excoriation and filthie ulcers, for scratching is the occasion of greater attraction. Wherefore you shall binde the sick childe's hand, and foment the itching parts with a decoction of marsh-mallows, barlie and lupines, with the addition of som salt. But if it bee alreadie excoriated, then shall you heal it with *unguent. album camphorat.* adding thereto a little powder of aloës or *Cinnabaris*, or a little *desiccativum rubrum*. But if notwithstanding all your application of repelling medicines, pustles nevertheles break forth at the eies, then must they bee diligently cured with all manner of *collyria*, haveing a care that the inflammation of that part grow not to that bigness, as to break the eies, and that which somtimes happen's to drive them forth of their proper orbs. If anie crustie ulcers arise in the nostrils, they may bee dried and caused to fall away by putting up of ointments. Such as arise in the mouth, palate

How to defend the eies.

When the eies must not bee defended by repercussives onely.

How to defend the nose.

How the mouth.

How the lungs

How to prevent pock-arrs.

Remedies for excoriation.

late and throat, with hoarſneſs and difficultie of ſwallowing, may bee helped by gargariſms made with barlie-water, the waters of plantain and chervil, with ſom ſyrup of roſes, or *Diamoron* diſſolved therein; the patient ſhall hold in his mouth ſugar of roſes or the tablets of *Elect. diatragacanth. frigid.* The Pock-arrs left in the face, if they bunch out undecently, ſhall bee clipped away with a pair of ſciſſers, and then annointed with freſh *ungnent. citrin.* or elſ with this liniment. R. *amyli triticei, & amygdalarum excorticatarum, an.* ℥iſ. *gum. tragacanth.* ℥ſ. *ſeminis melonum, fabarum ſiccarum excoriat. farinæ hordei, an.* ℥iiii. Let them all bee made into fine powder, and then incorporated with roſe-water, and ſo make a liniment, wherewith annoint the face with a feather; let it bee wiped away in the morning, waſhing the face with ſom water and wheat-bran; hereto alſo conduceth *lac virginale*; Gooſ, duck's and capon's greaſ are good to ſmooth the roughneſs of the skin, as alſo oil of lillies; hares-blood of one newly killed and hot, is good to fill and plain, as alſo whiten the pock-holes, if they bee often rubbed therewith. In ſtead hereof manie uſe the ſward of Bacon rubbed warm thereon; alſo the diſtilled waters of bean flowers, lillie-roots, reed-roots, egg-ſhels, and oil of eggs are thought verie prevalent to waſte and ſmooth the Pock-arrs.

For the ulcers of the mouth and jaws.

To help the unſightlie ſcars of the face.

A Diſcourſ of certain monſtrous creatures which breed againſt nature in the bodies of men, women, and little children, which may ſerv as an induction to the enſuing diſcourſ of worms.

As in the *macrocoſmos* or bigger world, ſo in the *microcoſmos* or leſſer world there are windes, thunders, earth-quakes, ſhowrs, inundations of waters, ſterilities, fertilities, ſtones, mountains & ſundrie ſorts of fruits & creatures thence ariſe. For whocan denie but that there is winde contained ſhut up in flatulent abſceſſes, and in the guts of thoſe that are troubled wᵗʰ the colick? Flatulencies make ſo great a noiſ in diverſ women's bellies, if ſo bee you ſtand near them, that you would think you heard a great number of frogs croaking on the night-time: That water is contained in waterie abſceſſes, & the bellie of ſuch as have the dropſie, is manifeſted by that cure which is performed by the letting forth of the water; in fits of Agues the whole bodie is no otherwiſe ſhaken & tremble's, then the earth when it is heard to bellow, and felt to ſhake under our feet. Hee which ſhall ſee the ſtones which are taken out of the bladder, and com from the kidnies and diverſ other parts of the bodie, cannot denie but that ſtones are generated in our bodies. Furthermore wee ſee both men and women who in their face or ſom other parts, ſhew the impreſſion, or imprinted figure of a cherrie, plumb, *ſervice*, fig-mulberrie and the like fruit; the cauſ hereof is thought to bee the power of the imagination concurring with the formative faculties, and the tenderneſs of the yeelding and wax-like *embryon*, eaſie to bee brought into anie form or figure by reaſon of the proper and native humiditie. For you ſhall finde that all their mothers whil'ſt they went with them have earneſtly deſired or longed for ſuch things, which, whil'ſt they have too earneſtly agitated in their mindes, they have tranſ-ferred the ſhape unto the childe, whil'ſt that they could not enjoy the things themſelvs. Now who can denie but that the bunches of the back and large wens reſemble mountains? Who can gain-ſay, but that ſqualid ſterilitie may bee aſſimilated to the hectick drineſs of waſted and conſumed perſons? and fertilitie deciphered by the bodie diſtended with much fleſh and fat, ſo that the legs can ſcarce ſtand under the burden of the bellie? But that diverſ creatures are generated in one creature, that is in man, and that in ſundrie parts of him, the following hiſtories ſhall make it evident.

A compariſon between the bigger and leſſer world.

The generation of winde in man's bodie.

Of water.

Of ſtones.

Of fruits from the firſt conformation.

Hollerius tell's that a certain Italian by frequent ſmelling to the herb Baſil, had a Scorpion bred in his brain, which cauſſed long & vehement pain, and at length death; therefore I have here expreſt the figure of that Scorpion, found, when as his brain was opened.

Lib. de morb. interc. 1.

The figure of a Scorpion.

It make's *Hollerius* conjecture of the cauſ and original of this Scorpion, probable for that *Chryſippus*, *Dyophanes* and *Plinie* write, that of baſil beaten between two ſtones, and laid in the ſun, there will com Scorpions.

Fernelius write's that in a certain ſouldier, who was flat noſed, upon the too long reſtraint or ſtoppage of a certain filthie matter that flowed out of the noſe, that there were generated two hairie worms of the bigneſs of ones finger, which at length made him mad, hee had no manifeſt fever, and hee died about the twentieth day: this was their ſhape, by as much as wee can gather by *Fernelius*'s his words.

Lib. 5. de part. morbis cap. 7.

The

The effigies of worms mentioned by Fernelius.

Lewis Duret, a man of great learning & credit, told me that he had com forth with his urine, after a long and difficult diſeaſ, a quick creature, of color red, but otherwiſe like in ſhape a Millepes, that is, a Cheſlop, or Hog-louſ. An hiſtorie.

The ſhape of a Millepes caſt forth by urine.

Count *Charls* of *Mansfeldt*, laſt Summer troubled with a grievous and continual fever, in the Duke of *Guiſes* place caſt forth a filthie matter at his yard, in the ſhape of a live thing almoſt juſt in this form. An hiſtorie.

The ſhape of a thing caſt forth by urine.

Monſtrous creatures alſo of ſundrie forms are alſo generated in wombs of women; ſomwhiles alone, otherwhiles with a *mola*, and ſomtime with a childe naturally and well made; as frogs, toads, ſerpents, lizzards: which therefore the Antients have termed the Lumbard's brethren, for that it was uſual with their women, that together with their natural and perfect iſſue they brought into the world worms, ſerpents, and monſtrous creatures of that kinde generated in their wombs, for that they alwaies more reſpected the decking of their bodies, then they did their diet. For it happened whileſt they fed on fruits, weeds and traſh, and ſuch things as were of ill juice, they generated a putrid matter, or certainly verie ſubject to putrefaction and corruption, and conſequently opportune to generate ſuch unperfect creatures. *Joubertus* telleth that there were two Italian women, that in one month brought forth each of them a monſtrous birth; the one that married a Tailor, brought forth a thing ſo little, that it reſembled a Rat without a tail; but the other a Gentlewoman, brought forth a larger, for it was of the bigneſs of a Cat; both of them were black, and as ſoon as they came out of the womb, they ran up high on the wall, and held faſt thereon with their nails. *Lycoſthenes* write's that in *Anno Dom.* 1494. a woman at *Cracovia*, in the ſtreet which taketh name from the holie Ghoſt, was delivered of a dead childe, who had a ſerpent faſtned upon his back, which fed upon this dead childe, as you perceiv by this following figure. *Nicolaus Flor. God. lib. 7. c. 18.* *Lib. error popul.*

The figure of a ſerpent faſtned to a childe.

Levinus Lemnius tell's a verie ſtrange hiſtorie to this purpoſe. Som few yeers agone (ſaith hee) a certain woman of the Iſle in Flanders, which being with childe by a Sailor, her bellie ſwelled *Lib. de occult. nat. mir. cap. 8.*

ſwelled up ſo ſpeedily, that it ſeemed ſhee would not bee able to carrie her burden to the term preſcribed by nature; her ninth month beeing ended ſhee call's a midwife, and preſently after ſtrong throws and pains, ſhee firſt brought forth a deformed lump of fleſh, haveing as it were two handles on the ſides, ſtretched forth to the length and manner of arms, and it moved and panted with a certain vital motion, after the manner of ſpunges and ſea-nettles; but afterwards there came forth of her womb a monſter with a crooked noſe, a long and round neck, terrible eies, a ſharp tail, and wonderful quick of the feet, it was ſhaped much after this manner.

The ſhape of a monſter that came forth of a woman's womb.

As ſoon as it came into the light it filled the whole room with a noiſe & hiſſing, running to everie ſide to finde out a lurking hole wherein to hide its head, but the women which were preſent, with a joint conſent fell upon it, and ſmothered it with cuſhions, at length the poor woman wearied with long travel, was delivered of a boie, but ſo evilly entreated and handled by this monſter, that it died as ſoon as it was chriſtened.

Lib. de divinis natur. Characteriſmis.

Cornelius Gemma a Phyſician of *Lovain*, telleth that there were manie verie monſtrous and ſtrange things caſt forth both upwards and downwards out of the bellie of a certain maid of *Lovain*, of the age of fifteen years. Amongſt the reſt, ſhee caſt forth at her fundament, together with her excrements, a liveing creature ſom foot & half long, thicker then ones thumb, verie like an eel, but that it had a verie hairie tail; I have here given you the figure of the monſter as it was expreſſed by him.

The figure of a monſter that came forth of a maid's bellie.

An hiſtorie.

Maſter *Peter Barque* and *Claude le grand*, Surgeons of *Verdun*, lately affirmed to mee that they cured the wife of a certain Citizen of *Verdun*, which out of an Abſceſs broken in the bellie, caſt forth a great number of worms, together with the quittur; and theſe were of the thickneſs of ones finger, with ſharp heads, which ſo gnawed her guts, that the excrements for a long time came forth at the ulcer, but now ſhee is perfectly recovered.

An hiſtorie.

Anthonie Benenius a Phyſician of *Florence* telleth; that one *John Menuſierus*, a man of fortie yeers of age, troubled with continual pains at his ſtomach, was often at the point of death, neither found hee anie help by the counſels of manie Phyſicians which hee uſed. At length comming to have his advice, hee gave him a vomit, by means whereof hee caſt up a great quantitie of corrupt and putrid matter, yet was hee not thereby eaſed of his pain. Therefore hee gave him another vomit, by force whereof hee caſt up much matter like to the former, and together therewith a worm of four fingers long, haveing a red round head, of the bigneſs of a great peaſ, covered over the bodie with a ſoft downineſs, with a forked tail, in manner of an half moon, going upon four feet, two before, and two behinde.

The figure of a worm caſt forth by vomit.

The

Why ſhould I mention the prodigious bodies which are found in abſceſſes, as ſtones, chalk, ſand, coles, ſnail-ſhels, ſtrawes, hay, horns, hairs, and manie kindes of living and dead creatures? For there is nothing in the generation of theſe things (cauſſed by corruption, preceded by much alteration) which may make us admire, or hold us in ſuſpence, eſpecially if wee ſhal conſider that nature, the fruitful parent of all things, hath put divers portions and particles of the univerſal matter whereof the greater world is compoſed into this *microcoſmos*, or little world, man; whereby hee might the rather ſeem to bee made to the reſemblance and form of the greater. Wherefore it ſo deſport's it ſelf here, that it may counterfeit and reſemble all the actions and motions which it uſeth to perform in the ſcene of the greater world, in this little one, if ſo bee that matter bee not wanting.

The efficient and material cauſſes of ſuch things as are preternaturally generated in our bodies.

CHAP. IIII.

Of the worms which uſe to breed in the guts.

A Groſs, viſcid and crude humor is the material cauſ of worms, which haveing got the beginning of corruption in the ſtomach, is quickly carried into the guts, and there it putrefie's, haveing not acquired the form of laudable *Chylus* in the firſt concoction. This, for that it is viſcid, tenaciouſly adhere's to the guts, neither is it eaſily evacuated with the other excrements; therefore by delay it further putrefies, and by the efficacie of heat, it turn's into the matter and nouriſhment for worms. This alimentarie humor beeing conſumed, unleſs ſom freſh, ſupplie the want thereof, which may eaſe their hunger, they moov themſelvs in the guts with great violence, they cauſ grievous and great pains, yea, and oftimes they creep up to the ſtomach, and ſo com forth by the mouth, and ſomtimes they aſcend into the holes of the palate, and com forth at the noſe. Worms are of three ſorts; for ſom are round and long, others broad and long, others ſhort and ſlender. The firſt are called by the Antients *Teretes*, that is, round; for that they are long and round. The ſecond are named *Teniæ*, for that their bodies are long and broad, like a rowler or ſwathe. The third are termed *Aſcarides*, for that they commonly wrap themſelvs up round. Other differences of worms are taken from their colors; as red, white, black, aſh-colored, yellowiſh. Som alſo are hairie, with a great head like the little fiſh which the French call *Chabot*, wee, a *Miller's-thumb*; in ſom diſeaſes manie worms are generated and caſt forth by the fundament, as ſmall as hairs, and uſually of color white, and theſe are they which are called *Aſcarides*. The diverſitie of colors in worms proceedeth not from the like diſtinct diverſitie of humors whereof they are generated. For the melancholick and cholerick humor by their qualities are wholly unfit to generate worms. But this manifold varietie in color, is by reaſon of the different corruption of the *chylous* or phlegmatick humor whereof they are bred. The long and broad worms are oftentimes ſtretched alongſt all the guts, beeing like to a mucous or albuminous ſubſtance; and verily I ſaw one voided by a woman, which was like to a ſerpent, and ſom ſix foot long, which ought not to ſeem ſtrange, ſeeing it is noted by the Antients, that they have ſeen worms ſo long, as the length of the whole guts, that is, ſeven times the length of ones bodie. *Wierus* write's, that hee ſaw a countrie-man who voided a worm eight foot and one inch long, in head and mouth reſembling a Duck, which therefore I have thought good here to expreſs.

How worms are generated.

The reaſon that they ſomtimes com forth at the mouth.

The differences of worms.

An hiſtorie.

An hiſtorie.

The figure of a worm, generated in, and caſt forth of the guts.

Valeriola affirmeth, that hee ſaw a worm above nine foot long. Now as worms differ in ſhape, ſo are their places of generation alſo different. For the round and long worms are commonly generated in the ſmaller guts, the reſt in the greater, but eſpecially the *Aſcarides*:

In obſervat.

In what places of the bellie worms are generated.

none breed in the ſtomach, as that which is the place of the firſt concoction. There truly the matter which breedeth theſe worms, get's the firſt rudiment of corruption, but com's to perfection onely in the guts; they breed in ſom infants in their mothers bellies, by the pravitie and corrupt nature of the humor flowing from the mother for the nouriſhment of the childe, which for that then they do not expell it by ſiege, it by delay putrefieth the more, and yield's fit matter for the breeding of worms, as ſom have obſerved out of *Hippocrates*. Laſtly, worms breed in people of anie age that are Bellie-gods, and given to gluttonie, as alſo in ſuch as feed upon meats of ill juice, and apt to corrupt, as crude ſummer-fruits, cheeſ, and milk-meats. But to know in what part of the guts the worms do lurk, you muſt note, that when they are in the ſmall guts, the patients complain of a pain in their ſtomach, with a dog-like appetite, whereby they require manie and ſeveral things without reaſon, a great part of the nouriſhment beeing conſumed by the worms lying there; they are alſo ſubject to often fainting, by reaſon of the ſympathie which the ſtomach, beeing a part of moſt exquiſite ſenſ, hath with the heart, the noſe itches, the breath ſtink's, by reaſon of the exhalations ſent up from the meat corrupting in the ſtomach; through which occaſion they are alſo given to ſleep, but are now and then waked there-from by ſudden ſtartings and fears; they are held with a continued and ſlow fever, a drie cough, a winking with their eie-lids, and often changeing of the color of their faces. But long and broad worms, beeing the innates of the greater guts, ſhew themſelvs by ſtools repleniſhed with manie ſloughs, here and there reſembling the ſeeds of a Musk-melon or Cucumber. *Aſcarides* are known by the itching they cauſ in the fundament, cauſſing a ſenſ as if it were Ants running up and down; cauſſing alſo a *tenaſmus*, and falling down of the fundament. This is the cauſ of all theſe ſymptoms; their ſleep is turbulent and often clamorous, when as hot, acrid and ſubtil vapors, raiſed by the worms from the like humor and their food, are ſent up to the head; but ſound ſleep by the contrarie, as when a miſtie vapor is ſent up from a groſs and cold matter. They dream they eat their ſleep, for that while the worms do more greedily conſume the *chylous* matter in the guts, they ſtir up the ſenſ of the like action in the phantaſie. They grate or gnaſh their teeth by reaſon of a certain convulſifick repletion, the muſcles of the temples and jaws beeing diſtended by plentie of vapors. A drie cough com's by the conſent of the vital parts ſerving for reſpiration, which the natural, to wit, the *Diaphragma*, or midriff, ſmit upon by acrid vapors, and irritated as though there were ſom humor to bee expelled by coughing. Theſe ſame acrid fumes aſſailing the orifice of the ventricle, cauſ either an hicketting, or elſ a fainting, according to the condition of their conſiſtence, groſs or thin; theſe carried up to the parts of the face cauſ an itching of the noſe, a darkneſs of the ſight, and a ſudden changeing of the color in the cheeks. Great worms are worſ then little ones, red then white, living then dead, manie then few, variegated then thoſe of one color, as thoſe which are ſigns of a greater corruption. Such as are caſt forth bloodie and ſprinkled with blood, are deadlie, for they ſhew that the ſubſtance of the guts is eaten aſunder; for oftimes they corrode and perforate the bodie of the gut wherein they are contained, and thence penetrate into divers parts of the bellie, ſo that they have com forth ſomtimes at the navel, haveing eaten themſelvs a paſſage forth, as *Hollerius* affirmeth. When as children troubled with the worms draw their breath with difficultie, and wax moiſt over all their bodies, it is a ſign that death is at hand. If at the beginning of ſharp fevers, round worms com forth alive, it is a ſign of a peſtilent fever, the malignitie of whoſe matter they could not endure, but were forced to com forth. But if they bee caſt forth dead, they are ſigns of greater corruption in the humors, and of a more venenate malignitie.

Ad finem lib. 4. de morbis.

Signs of worms in the ſmall guts.

Signs of worms in the great guts.

Signs of *Aſcarides*.

Why worms of divers colors are more dangerous.

CHAP. V.

What cure to bee uſed for the Worms.

The general indications of cureing the worms.

IN this diſeaſ there is but one indication, that is, the excluſion or caſting out of the worms, either alive or dead, forth of the bodie, as beeing ſuch that in their whole kinde are againſt nature; all things muſt bee ſhunned which are apt to heap up putrefaction in the bodie by their corruption, ſuch as are crude fruits, cheeſ, milk-meats, fiſhes, and laſtly, ſuch things as are of a difficult and hard digeſtion, but prone to corruption. Pap is fit for children, for that they require moiſt things, but theſe ought to anſwer in a certain ſimilitude to the conſiſtence and thickneſs of milk, that ſo they may the more eaſily bee concocted and aſſimilated, and ſuch onely is that pap which is made with wheat flower, not crude, but baked in an oven, that the pap made therewith may not bee too viſcid nor thick, if it ſhould onely bee boiled in a pan as much as the milk would require; or elſ the milk would bee too terreſtrial, or too wateriſh, all the fattie portion thereof beeing reſolved, the cheeſie and whayiſh portion remaining, if it ſhould boil ſo much as were neceſſarie for the ful boiling of the crude meat;

meat; they which uſe meal otherwiſe in pap yeeld matter for the generateing of groſs and viſcid humors in the ſtomach, whence happen's obſtruction in the firſt veins and ſubſtance of the liver; by obſtruction worms breed in the guts, and the ſtone in the kidnies and bladder. The patient muſt bee fed often, and with meats of good juice, leſt the worms through want of nouriſhment, ſhould gnaw the ſubſtance of the guts. Now when as ſuch things breed of a putrid matter, the patient ſhall bee purged, and the putrefaction repreſt by medicines mentioned in our Treatiſe of the Plague. For the quick killing and caſting of them forth, ſyrup of ſuccorie, or of lemmons with rubarb, a little treacle or methridate is a ſingular medicine, if there bee no fever; you may alſo for the ſame purpoſe uſe this following medicine. ℞. *cornu cervi, pul. raſur. eboris, an.* ʒiſs. *ſem. tanacet. & contra verm. an.* ʒi. *fiat decoctio pro parvâ doſi, in colaturâ infunde rhei optimi,* ʒi. *cinam.* ℈i *diſſolve ſyrupi de abſinthio,* ʒſs. make a potion, give it in the morning three hours before anie broth. Oil of Olives drunk, kill's worms; as alſo water of knot-graſs drunk with milk; and in like manner all bitter things. Yet I could firſt wiſh them to give a glyſter made of milk, honie and ſuger, without oils and bitter things, leſt ſhunning thereof, they leav the lower guts, and com upwards; for this is natural to worms, to ſhun bitter things, and follow ſweet things. Whence you may learn, that to the bitter things which you give by the mouth, you muſt alwaies mix ſweet things, that allured by the ſweetneſs, they may devour them more greedily, that ſo they may kil them. Therefore I would with milk and ſuger, mix the ſeeds of centaurie, *Rue*, wormwood, aloës and the like: hartſ-horn is verie effectual againſt worms, wherefore you may infuſe the ſhaveings thereof in the water or drink that the patient drink's, as alſo to boil ſom thereof in his broths. So alſo treacle drunk or taken in broth, killeth the worms; purſlain boiled in broths, and diſtilled and drunk, is alſo good againſt the worms; as alſo ſuccorie and mints; alſo a decoction of the leſſer houſ-leek and ſebeſtens given with ſuger before meat; it is no leſs effectual to put worm-ſeeds in their pap, and in roſted apples, and ſo to give them it. Alſo you may make ſuppoſitories after this manner, and put them up into the fundament. ℞. *coralli ſub-albi, raſuræ eboris, cornu cervi uſti, ireos an.* ℈ii. *mellis albi* ʒiiſs. *aquæ centinodiæ q. ſ. ad omnia con-corporanda, fiant Glandes:* let one bee put up everie daie, of the weight of ʒii. for children; theſe ſuppoſitories are chiefly to bee uſed for *Aſcarides*, as thoſe which adhere to the right gut. To ſuch children as can take nothing by the mouth, you ſhall applie cataplaſms to their navels made of the powder of cummin-ſeeds, the flowr of lupines, worm-wood, ſouthern-wood, tanſie, the leavs of artichokes, *Rue*, the powder of *coloquintida*, citron-ſeeds, aloës, arſ-ſmart, horſ-mint, peach-leavs, *Coſtus amarus, Zedoaria*, ſope and ox-gall. Such cataplaſms are oftimes ſpred over all the bellie, mixing therewith aſtringent things for the ſtrengthening of the part, as oil of myrtles, Quinces and maſtich; you may alſo applie a great onion hollowed in the mid'ſt, and filled with aloës and treacle, and ſo roſted in the members, then beaten with bitter almonds, and an ox-gall. Alſo you may make emplaſters of bitter things, as this which follow's. ℞. *fellis bubuli, ſuccí abſinthii, an.* ʒii. *calocyn.* ʒi. *terantur & miſceantur ſimul, incorporentur cum farinâ lupinorum:* make hereof an emplaſter to bee laid upon the Navel.

Wherfore, and wherwith, ſuch as have the worms, muſt bee purged.

Hartſ-horn good againſt the worms.

Suppoſitories againſt the *Aſcarides*.

A plaſter againſt the worms.

Liniments and ointments may bee alſo made for the ſame purpoſe to annoint the bellie, you may alſo make plaſters for the navel of *pillulæ ruf.* annointing in the mean time the fundament with honie and ſuger, that they may bee chaſed from above with bitter things, and allured downwards with ſweet things. Or elſ take worms that have been caſt forth, drie them in an iron-pan over the fire, then powder them, and give them with wine or ſom other liquor to bee drunk, for ſo they are thought quickly to kill the reſt of the worms. Hereto alſo conduceth the juice of citrons, drunk with the oil of bitter almonds, or ſallet-oil. Alſo ſom make bathes againſt this affect of worm-wood, galls, peach-leavs boiled in water, and then bathe the chiſde therein.

But in cureing the worms, yon muſt obſerv that this diſeaſ is oftimes entangled with another more grievous diſeaſ, as an acute and burning fever, a flux or ſcouring, and the like, in which (as for example ſake) a fever beeing preſent and conjoined therewith, if you ſhall give worm-ſeeds, old Treacle, myrrh, aloës, you ſhall increaſ the fever and flux, for that bitter things are verie contrarie to theſe affects. But if, on the contrarie, in a flux whereby the worms are excluded, you ſhall give corral, and the flowr of Lentils, you ſhall augment the fever, makeing the matter more contumacious by drie and aſtringent things. Therefore the Phyſician ſhall bee careful in conſidering whether the fever bee a ſymptom of the worms, or on the contrarie it bee eſſential, and not ſymptomatick; that this beeing known, hee may principally inſiſt in the uſe of ſuch medicines as reſiſt both affects, as purgeing and bitteriſh in a fever and worms, but bitter and ſomwhat aſtrictive things in the worms and flux.

A fever ſometimes a ſymptom, and ſometimes a diſeaſ.

CHAP. VI.

A ſhort deſcription of the Elephantiaſis *or Leproſie, and of the cauſſes thereof.*

THis diſeaſ is termed *Elephantiaſis*, becauſ the skin of ſuch as are troubled therewith is rough, ſcabious, wrinkled and unequal, like the skin of an Elephant. Yet this name may ſeem to bee impoſed thereon by reaſon of the greatneſs of the diſeaſ. Som from the opinion of the Arabians have termed it *Lepra*, or Leproſie (but unproperly, for the *Lepra* is a kinde of ſcab and diſeaſ of the skin, which is vulgarly called *Malum ſancti mauis*) which word for the preſent wee will uſe, as that which prevail's by cuſtom and antiquitie. Now the Leproſie (according to *Paulus*) is a Cancer of the whole bodie, the which (as *Avicen* add's) corrupt's the complexion, form and figure of the members. *Galen* think's the cauſ ariſeth from the error of the ſanguifying facultie, through whoſe default the aſſimilation in the fleſh and habit of the bodie is depraved, and much changed from it ſelf, and the rule of nature. But *ad Glauconem*, hee define's this diſeaſ, An effuſion of troubled or groſs blood into the veins and habit of the whole bodie. This diſeaſ is judged great, for that it partake's of a certain venenate virulencie, depraveing the members and comlineſs of the whole bodie. Now it appear's, that the Leproſie partake's of a certain venenate virulencie by this, that ſuch as are melancholick in the whole habit of their bodies, are not leprous. Now this diſeaſ is compoſed of three differences of diſeaſes: Firſt, it conſiſt's of a diſtemper againſt nature, as that which at the beginning is hot and drie, and at length the ebullition of the humors ceaſing, and the heat diſperſed, it becom's cold and drie, which is the conjunct cauſ of this ſymptom. Alſo it conſiſt's of an evil compoſition or conformation, for that it deprave's the figure and beautie of the parts. Alſo it conſiſt's of a ſolution of continuitie, when as the fleſh and skin are cleft in divers parts with ulcers and chops. The Leproſie hath for the moſt part three general cauſſes, that is, the primitive, antecedent, and conjunctive: The primitive cauſ is either from the firſt conformation, or com's to them after they are born. It is thought to bee in him from the firſt conformation, who was conceived of depraved and menſtruous blood, and ſuch as inclined to melancholie; who was begot of the leprous ſeed of one or both his parents, for leprous perſons generate leprous, becauſ the principal parts beeing tainted and corrupted with a melancholick and venenate juice, it muſt neceſſarily follow, that the whole maſs of blood and ſeed that fall's from it, and the whole bodie ſhould alſo bee vitiated. This cauſ happen's to thoſe that are alreadie born, by long ſtaying and inhabiting in maritime countries, whereas the groſs and miſtie air, in ſucceſs of time, induceth the like fault into the humors of the bodie; for that, according to *Hippocrates*, ſuch as the air is, ſuch is the ſpirit, and ſuch the humors. Alſo long abideing in verie hot places, becauſ the blood is torrified by heat, but in cold places, for th at they incraſſate, and congealing the ſpirits do after a manner ſtupifie, may bee thought the primitive cauſſes of this diſeaſ. Thus in ſom places of Germanie there are divers leprous perſons; but they are more frequent in Spain, and over all Africa, then in all the world beſide, and in Languedoc, Provence and Guyenne, are more then in whole France beſides. Familiaritie, copulation, and cohabitation with leprous perſons may bee reckoned amongſt the cauſſes thereof, becauſ they transfer this diſeaſ to their familiars by their breath, ſweat and ſpittle left on the edges of the pots or cups. This diſeaſ is alſo cauſſed by the too frequent uſe of ſalt, ſpiced, acrid and groſs meats, as the fleſh of Swine, Aſſes, Bears, pulſ, milk-meats; ſo alſo groſs and ſtrong wines, drunkenneſs, gluttonie, a laborious life, full of ſorrow and cares, for that they incraſſate, and as it were burn the blood. But the retention of melancholick excrements, as the ſuppreſſion of the hemorrhoids, courſes, ſmall pocks and meazles, as alſo a quartain fever accuſtomed to com at ſet-times; the drying up of old ulcers, for that they defile the maſs of the blood with a melancholick droſs and filth. Now you muſt underſtand, that the cauſ of the Leproſie by the retention of the ſuperfluities, happen's, becauſ the corrupt blood is not evacuated, but regurgitate's over the whole bodie, and corrupt's the blood that ſhould nouriſh all the members; wherefore the aſſimilative facultie cannot well aſſimilate by reaſon of the corruption and default of the juice; and thus in concluſion the Leproſie is cauſſed. The antecedent cauſſes are the humors diſpoſed to aduſtion and corruption into melancholie, by the torrid heat; for in bodies poſſeſſed with ſuch heat, the humors by aduſtion eaſily turn into melancholie, which in time acquiring the malignitie and corruption of a virulent and venenate qualitie, yield's a beginning and eſſence to the Leproſie. The conjunct cauſſes are the melancholick humors, which are now partakers of a venenate and malign qualitie, and ſpread over the whole habit of the bodie, corrupting and deſtroying it firſt by an hot and drie diſtemper, and then by a cold and drie, contrarie to the beginnings of life. For hence inevitable death muſt enſue, becauſ our life conſiſt's in the moderation of heat and moiſture.

Lib. 4. cap. 1. *Lib. 2. cap. 11.*

There is a certain hidden virulencie in the Leproſie.

The primitive cauſ of a Leproſie.

How they may bee leprous from their firſt conformation.

The antecedent cauſ of a Leproſie.

The conjunct cauſ.

How it com's to bee deadlie.

CHAP.

CHAP. VII.

The signs of a Leprosie, breeding, present, and alreadie confirmed.

THe disposition of the bodie and humors to a Leprosie is shewed by the change of the native and fresh color of the face, by that affect of the face, which is commonly called *Gutta rosacea*, red and blackish suffusions and pustles, the falling away of the hairs, and a great thirst, and a driness of the mouth both by night and day, a stinking breath, little ulcers in the mouth, the change of the voice to hoarsness, a desire of venerie above nature and custom. Now there are four times of this disease, the beginning, increas, state and declension. The beginning is, when as the malignitie hath not gon further then the inner parts and bowels, wherupon the strength must need's bee more languid. The increas is, when as the virulencie com's forth, and the signs and symptoms are everie day increased in number and strength. The state is, when as the members are exulcerated. The declension is, when as the aspect of the face is horrid, the extreme parts fall away by the profunditie and malignitie of the ulcers, so that none, no not of the common sort of people, can doubt of the disease. According to the doctrine of the Antients, wee must in searching out of the signs of this disease beeing present, have chief regard to the head. For the signs of diseases more properly and truly shew themselvs in the face, by reason of the softness and raritie of the substance thereof, and the tenuitie of the skin that cover's it; wherefore a black and adust humor diffused there-under, easily shew's it self, and that not onely by the mutation of the color, but also of the character and bulk, and oftimes by manifest hurting it. Wherefore you must observ in the head whether it have scauls, and whether in the place of those hairs that are fallen away, others more tender, short and rare grow up, which is likely to happen through defect of fit nourishment to preserv and generate hairs, through corruption of the hairie scalp that should bee stored with such nourishment, and of the habit it self, and through the unfitness thereof to contain hairs: lastly, by the acrimonie of the vapors sent up from the adust humors and entrails, fretting asunder the roots of the hairs. But if not onely the hair, but also som portion of the skin and flesh about the roots of the hair, com away by pulling, it is an argument of perfect corruption: let this therefore be the first sign of a Leprosie. A second and verie certain sign is, a numerous and manifest circumscription of round and hard pushes or pustles under the eie-brows, and behinde the ears, and in several places of the face, resembling round and hard kernels, occasioned by the default of the assimulating facultie. The caus of this default is the grosness of the flowing nourishment, by which means it beeing impact, and stopping in the straitness of the way, it grow's round, as it were compassed about in the place whereas it stick's, and by the means of the cruditie, for that it is not assimulated, and by delay, it is further hardned. The third sign is, the more contract and exact roundness of the ears, their grosness, and as it were grainie spissitude or densness; the caus of their roundness is the consumption of the flaps and fleshie part through want of nourishment, and exces of heat; but the occasion of their grainie spissitude is the grosness of the earthie nourishment flowing thither. The fourth sign is a Lion-like wrinkling of the fore-head, which is the reason that som term this disease *morbus Leoninus*; the caus hereof is the great driness of the habit of the bodie, which also is the reason that the bark of an old oak is rough and wrinkled. The fifth is, the exact roundness of the eies, and their fix't and immoovable steddiness; verily the eies are naturally almost round, yet they appear obtuse, and somwhat broad on the fore-side, but end in a *Conus* on the hind part, by reason of the concours and figure of the muscles and fat investing them. Therefore these beeing consumed either through defect of laudable nourishment, or els by the acrimonie of the flowing humor, they are restored to their proper figure and roundness. Now the muscles which mooved the eies beeing consumed, and the fat which facilitated their motion wasted, it com's to pass that they stand stiff and unmoovable, beeing destitute of the parts yeelding motion, and the facilitie thereof. The sixth sign is, the nostrils flat outwardly, but inwardly straight and contracted, that is, an earthie and gros humor forced from within outwards, which swel's the sides or edges of the nostrils; whence it is, that the passages of the nose appear as it were obstructed by the thickness of this humor; but they are depressed and flatted by reason of the rest of the face and all the neighboring parts swoln more then their wont; add hereto that the partition is consumed by the acrimonie of the corrodeing and ulcerateing humor. The seventh is, the lifting up, thickness and swelling of the lips, the filthiness, stinch and corrosion of the gums by acrid vapors riseing to the mouth; but the lips of leprous persons are more swoln by the internal heat burning and incrassateing the humors, as the outward heat of the Sun doth in the Moors. The eighth sign is, the swelling and blackness of the tongue, and as it were varicous veins lying under it; becaus the tongue, beeing by nature spongeous and rare, is easily stored with excrementitious humors, sent from the inner parts unto the habit of the bodie: which same is the caus why the granduleæ placed about the tongue above and below, are swoln hard & round, no otherwise then scrophulous or meazled swine. Lastly, all their face riseth in red

The beginning of a Leprosie.
The increas.
The state.
The declension.
The first sign of the Leprosie.
II.
III.
IV.
Why it is called *morbus Leoninus*.
V.
VI.
VII.
VIII.

bunches or puſhes, and is over-ſpread with a duskie and obſcure redneſs; the eies are fierie, fierce and fixed, by a melancholick chachectick diſpoſition of the whole bodie, manifeſt ſigns whereof appear in the face by reaſon of the fore-mentioned cauſſes, yet ſom leprous perſons have their faces tinctured with a yellowiſh, others with a whitiſh color, according to the condition of the humor, which ſerv's for a *baſis* to the leprous malignitie. For hence Phyſicians affirm that there are three ſorts of Leproſies; one of a reddiſh black color, conſiſting in a melancholick humor; another of a yellowiſh green, in a cholerick humor; another in a whitiſh yellow, grounded upon aduſt phlegm. IX. The ninth ſign is a ſtinking of the breath, as alſo of all the excrements proceeding from leprous bodies, by reaſon of the ma- X. lignitie conceived in the humors. The tenth is, a hoarſneſs, a ſhakeing, harſh and obſcure voice, comming as it were out of the noſe, by reaſon of the lungs, recurrent nervs, and muſcles of the throttle tainted with the groſneſs of a virulent and aduſt humor; the fore-mentioned conſtriction and obſtruction of the inner paſſage of the noſe; and laſtly, the aſperitie and inequalitie of the weazon by immoderate drineſs, as it happen's to ſuch as have drunk plentifully of ſtrong wines without anie mixture. This immoderate drineſs of the muſcles ſerving for reſpiration make's them to bee troubled with a difficultie of breathe- XI. ing. The eleventh ſign is verie obſervable, which is a morphew or defedation of all the skin, with a drie roughneſs and grainie inequalitie, ſuch as appear's in the skins of plucked geeſ, with manie tetters on everie ſide, a filthie ſcab, and ulcers not caſting off onely a brain-like ſcurf, but alſo ſcales and cruſts. The cauſ of this drie ſcab is the heat of the burning bowels and humors unequally contracting and wrinkling the skin, no otherwiſe then as leather is wrinkled by the heat of the ſun or fire. The cauſ of the filthie ſcab and ſerpigi-nous ulcers, is the eating and corrodeing condition of the melancholick humor, and the venenate corruption, it alſo beeing the autor of corruption, ſo that it may bee no marvell if the digeſtive facultie of the liver beeing ſpoiled, the aſſimilative of a malign and unfit matter ſent into the habit of the bodie cannot well nor fitly perform that which may bee for the XII. bodie's good. The twelfth is, the ſenſ of a certain pricking, as it were of goads or needles over all the skin, cauſſed by an acrid vapor hindred from paſſing forth, and intercepted by XIII. the thickneſs of the skin. The thirteenth is a conſumption and emaciation of the muſcles which are between the thumb and fore-finger, not onely by reaſon that the nouriſhing and aſſimilating faculties want fit matter wherewith they may repair the loſs of theſe parts, for that is common to theſe with the reſt of the bodie; but becauſ theſe muſcles naturally riſe up unto a certain mountanous tumor, therfore their depreſſion is the more manifeſt. And this is the cauſ that the ſhoulders of leprous perſons ſtand out like wings; to wit, the emaciation of XIV. the inward part of the muſcle *Trapezites*. The fourteenth ſign is, the diminution of ſenſ, or a numneſs over all the bodie by reaſon that the nervs are obſtructed by the thickneſs of the melancholick humor hindring the free paſſage of the animal ſpirit, that it cannot com to the parts that ſhould receiv ſenſ, theſe in the *interim* remaining free which are ſent into the muſcles for motion's ſake, and by this note I chiefly make trial of leprous perſons, thruſting a ſom-what long and thick needle ſom-what deep into the great tendon endued with moſt exquiſite ſenſ, which run's to the heel, which, if they do not well feel, I conclude, that they are certainly leprous. Now, for that they thus loſe their ſenſ, their motion remaining entire, the cauſ hereof is, that the nervs which are diſſeminated to the skin are more affected, and thoſe that run into the muſcles are not ſo much; and therefore when as you prick them ſomwhat deep, they feel the prick, which they do not in the ſurface of the skin. The fif- XV. teenth is, the corruption of the extreme parts poſſeſſed by putrefaction and a gangrene, by reaſon of the corruption of the humors ſent thither by the ſtrength of the bowels, infecting with the like tainture the parts wherein they remain: add hereto that the animal ſenſitive facultie is there decaied, and as often as anie facultie hath forſaken anie part, the reſt pre- XVI. ſently after a manner neglect it. The ſixteenth is, they are troubled with terrible dreams, for they ſeem in their ſleep to ſee divels, ſerpents, dungeons, graves, dead bodies, and the like, by reaſon of the black vapors of the melancholick humor troubling the phantaſie with black and diſmal viſions, by which reaſon alſo ſuch as are bitten of a mad dog fear the wa- XVII. ter. The ſeventeenth is, that at the beginning and increaſ of the diſeaſ they are ſubtil, craftie and furious by reaſon of the heat of the humors and blood; but at length in the ſtate and declenſion they becom craftie and ſuſpicious, the heat and burning of the blood and entrails decaying by little and little; therefore then fearing all things whereof there is no XVIII. cauſ, and diſtruſting of their own ſtrength, they endeavor by craft maliciouſly to circumvent thoſe with whom they deal, for that they perceiv their powers to fail them. The eighteenth is, a deſire of venerie above their nature, both for that they are inwardly burned with a ſtrange heat, as alſo by the mixture of flatulencies therewith (for whoſe generation the melancholick humor is moſt fit) which are agitated, and violently carried through the veins and genital parts by the preternatural heat; but at length, when this heat is cooled, and that they are fallen into an hot and drie diſtemper, they mightily abhor venerie, which then would bee verie hurtful to them, as it alſo is at the beginning of the diſeaſ, becauſ they have XIX. ſmall ſtore of ſpirits and native heat, both which are diſſipated by venerie. The nineteenth

is,

is, the so great thickness of their gross and livid blood, that if you wash it, you may finde a sandie matter therein, as som have found by experience, by reason of the great adustion and assation thereof. The twentieth is, the languidness and weakness of the pulse (by reason of the oppression of the vital and pulsifick facultie by a cloud of gross vapors.) Herewith also their urine somtimes is thick and troubled, like the urine of carriage-beasts, if the urinarie vessels bee permeable and free; othetwise it is thin, if there bee obstruction, which onely suffer's that which is thin to flow forth by the urinarie passages; now the urine is oftentimes of a pale ash-color, and oftimes it smell's like as the other excrements do in this disease. Verily there are manie other signs of the Leprosie; as the slowness of the bellie by reason of the heat of the liver, often belchings by reason that the stomach is troubled by the reflux of a melancholick humor, frequent sneesing by reason of the fulness of the brain; to these, this may bee added most frequently, that the face and all the skin is unctuous or greasie, so that water poured thereon, will not in anie place adhere thereto: I conceiv it is by the internal heat dissolving the fat that lie's under the skin, which therefore alwaies look's as if it were greased or annointed therewith in leprous persons. Now of these fore-mentioned signs, som are univocal, that is, which truly and necessarily shew the Leprosie: other-som are equivocal or common, that is, which conduce as well to the knowledg of other diseases as this. To conclude, that assuredly is a Leprosie which is accompanied with all, or certainly the most part of these fore-mentioned signs.

XX.

Why their faces seem to bee greasie.

CHAP. VIII.

Of Prognosticks in the Leprosie; and how to provide for such as stand in fear thereof.

THe Leprosie is a disease which passeth to the issue, as contagious almost as the Plague, scarce cureable at the beginning, incureable when as it is confirmed, becaus it is a *Cancer* of the whole bodie; now if som one *Cancer* of some one part shall take deep root therein, it is judged incureable. Furthermore, the remedies which to this day have been found out against this disease, are judged inferior and unequal in strength thereto. Besides, the signs of this disease do not outwardly shew themselvs before that the bowels bee seized upon, possessed and corrupted by the malignitie of the humor, especially in such as have the white Leprosie, sundrie of which you may see about Burdeaux, and in little Brittain, who notwithstanding inwardly burn with so great heat, that it will suddenly wrinkle and wither an apple held a short while in their hand, as if it had laid for manie daies in the sun. There is another thing that increaseth the difficultie of this disease, which is an equal pravitie of the three principal facultie whereby life is preserved. The deceitful and terrible visions in the sleep, and numness in feeling, argue the depravation of the animal facultie; now the weakness of the vital facultie is shewed by the weakness of the pulse, the obscuritie of the hoars and jarring voice, the difficultie of breatheing, and stinking breath; the decay of the natural is manifested by the depravation of the work of the liver in sanguification, whence the first and principal cause of this harm ariseth. Now becaus wee cannot promise cure to such as have a confirmed Leprosie; and that wee dare not do it to such as have been troubled therewith but for a short space, it remain's that wee briefly shew how to free such as are readie to fall into so fearful a disease. Such therefore must first of all shun all things in diet and cours of life, whereby the blood and humors may bee too vehemently heated, wherof wee have formerly made som mention. Let them make choice of meats of good or indifferent juice, such as wee shall describe in treating of the diet of such as are sick of the plague: purgeing, bleeding, batheing, cupping, to evacuate the impuritie of the blood, and mitigate the heat of the liver, shall bee prescribed by som learned Physician. *Valesius de Tarenta* much commend's gelding in this case, neither do I think it can bee disliked. For men subject to this disease may bee effeminated by the amputation of their testicles, and so degenerate into a womanish nature, and the heat of the liver boiling the blood, beeing extinguished, they becom cold and moist, which temper is directly contrarie to the hot and drie distemper of leprous persons; besides the leprous beeing thus deprived of the facultie of generation, that contagion of this disease is taken away which spreadeth, and is diffused amongst mankinde by the propagation of their issue.

Why the Leprosie is incurable.

The cure.

The diet.

Gelding good against the leprosie.

The end of the twentieth Book.

Of *Poiſons*, and of the *Biteing* of a mad Dog, and the *Biteings* and *Stingings* of other venemous Creatures.

The one and twentieth Book.

CHAP. I.

The cauſ of writeing this Treatiſe of Poiſons.

Five reaſons have principally mooved mee to undertake to write this Treatiſe of Poiſons, according to the opinion of the Antients. The firſt is, that I might inſtruct the Surgeon what remedies muſt preſently bee uſed to ſuch as are hurt by poiſons, in the *interim* whil'ſt greater means may bee expected from a Phyſician. The ſecond is, that hee may know by certain ſigns & notes ſuch as are poiſoned or hurt by poiſonous means, and ſo make report thereof to the Judges, or to ſuch as it may concern. The third is, that thoſe Gentlemen and others who live in the countrie, and far from Cities, and ſtore of greater means, may learn ſomthing by my labors by which they may help their friends bitten by an Adder, mad Dog, or other poiſonous creature, in ſo dangerous, ſudden and unſual a caſe. The fourth is, that everie one may beware of poiſons, and know their ſymptoms when preſent, that beeing known, they may ſpeedily ſeek for a remedie. The fifth is, that by this my labor all men may know what my good will is, and how well minded I am towards the common-wealth in general, and each man in particular, to the glorie of God. I do not here ſo much arm malicious and wicked perſons to hurt, as Surgeons to provide to help and defend each man's life againſt poiſon; which they did not underſtand, or at leaſt ſeemed not ſo to do, which takeing this my labor in evil part, have maliciouſly interpreted my meaning.

But now at length, that wee may com to the matter; I will begin at the general diviſion of poiſons, and then handle each *ſpecies* thereof ſeverally: but firſt let us give this rule, That poiſon is that which either outwardly applied or ſtruck in, or inwardly taken into the bodie, hath power to kill it, no otherwiſe, then meat well dreſt is apt to nouriſh it. For *Conciliator* write's, that the properties of poiſon are contrarie to nouriſhments in their whole ſubſtance; for as nouriſhment is turned into blood, and in each part of the bodie whereto it is applied to nouriſh, by perfect aſſimilation is ſubſtituted in the place of that portion which flow's away each moment. Thus on the contrarie poiſon turn's our bodies into a nature like it ſelf and venenate, for as everie agent imprint's the force and qualities thereof in the ſubject patient, thus poiſon by the immoderation of faculties in their whole nature contrarie to us, changeth our ſubſtance into its nature, no otherwiſe then fire turneth chaff in a moment into its own nature, and ſo conſume's it. Therefore it is truly delivered by the Antients, who have diligently pried into the faculties of natural things, that it is poiſon that may kill men by deſtroying and corrupting their temper, and the compoſure and conformation of the bodie. Now all poiſons are ſaid to proceed either from the corrupt air, or from living creatures, plants and minerals, or by an artificial malignitie in diſtilling, ſubliming and diverſly mixing of poiſonous and fuming things. Hence ariſe ſundrie differences of poiſons; neither do they all work after the ſame manner: for ſom corrupt our nature by the unmeaſureableneſs of the manifeſt and elementarie qualities whereof they conſiſt, others from a ſpecifick and occult propertie. Hence it is that ſom kill ſooner then other-ſom; neither is it true, that all of them preſently aſſail the heart, but others are naturally at deadlie ſtrife with other parts of the bodie, as *Cantharides* with the bladder, the ſea-Hare with the lungs, the *Torpedo* with the hands, which it ſtupefieth, though the fiſhers rod bee betwixt them. Thus of medicines, there are ſom which are apt preſently to comfort and ſtrengthen the heart; others the brain, as *ſtaechas*; others the ſtomach, as cinnamon: Alſo there are ſom poiſons which work both waies, that is, by manifeſt and occult qualities, as *Euphorbium*; for that both by the exceſſive heat and the whole ſubſtance, or the diſcord of the whole ſubſtance with ours, corrupt's our nature. An argument hereof is, that Treacle, which by its qualitie is manifeſtly hot, infringeth the force thereof, as alſo of all others of an occult propertie. Poiſons which work by an occult and ſpecifick propertie, do not therefore

What is to bee accounted poiſon.

The differences of poiſon.

All poiſons have not a peculiar antipathie with the heart.

fore do it, becauſ they are too immoderately hot, cold drie, moiſt; but for that they are abſolutely ſuch, and have that eſſence from the ſtarrs and celeſtial influence, which is apt to diſſolv and deſtroie the ſtrength of man's bodie, becauſ beeing taken, but even in a ſmal quantitie, yet are they of ſo pernicious a qualitie, that they kill almoſt in a moment. Now poiſons do not onely kill beeing taken into the bodie, but ſom beeing put or applied outwardly; neither do venemous creatures onely harm by their ſtinging and biteing, but alſo by their excrements, as ſpittle, blood, the touch and breath.

CHAP. II.

How poiſons beeing ſmall in quantitie, may by their onely touch cauſ ſo great alterations.

IT ſeemeth ſtrange to manie, how it may com to paſs, that poiſon taken or admitted in a ſmall quantitie, may almoſt in a moment produce ſo pernicious effects over all the bodie, and all the parts, faculties, and actions, ſo that beeing admitted but in a little quantitie, it ſwell's up the bodie into a great bigneſs. Neither ought it to ſeem leſs ſtrange, how Antidotes and Counterpoiſons, which are oppoſed to poiſon, can ſo ſuddenly break and weaken the great and pernicious effects thereof, beeing it is not likely that ſo ſmall a particle of poiſon or Antidote can divide it ſelf into ſo manie, and ſo far ſever'd particles of our bodie. There are ſom (ſaith *Galen*) who think that ſom things by touch onely, by the power of their qualitie, may alter thoſe things which are next to them; and that this appear's plainly in the fiſh *Torpedo*, as that which hath ſo powerful a qualitie, that it can ſend it along'ſt the fiſher's rod to the hand, and ſo make it becom torped or numb. But on the contrarie, Philoſophers teach, that accidents, ſuch as qualities are, cannot without their ſubjects remove and diffuſe themſelvs into other ſubjects. Therefore *Galen's* other anſwer is more agreeable to reaſon, that ſo manie and great affects of poiſons and remedies ariſe either from a certain ſpirit or or ſubtil humiditie; not truly, for that this ſpirit and ſubtil humiditie may bee diſperſed over the whole bodie and all the parts thereof which it affect's, but that little, which is entred the bodie, as caſt in by the ſtroak of a Spider, or the ſting of a Scorpion, infect's and corrupt's all the next parts by contagion with the like qualitie, theſe others that are next to them, until from an exceeding ſmall portion of the blood, if the ſtroak ſhall light into the veins, it ſhall ſpread over the whole maſs of blood; or of phlegm, if the poiſon ſhall chance to com to the ſtomach, and ſo the force thereof ſhall bee propagated and diffuſed over all the humors and bowels. The doubt of Antidotes is leſs, for theſe beeing taken in greater quantitie, when they ſhall com into the ſtomach, warmed by the heat of the place, they becom hot, and ſend forth vapors, which ſuddenly diffuſed over the bodie by the ſubtiltie of their ſubſtance, do by their contrarie forces dull and weaken the malignitie of the poiſon. Wherefore you may often ſee when as Antidotes are given in leſs quantitie then is fit, that they are leſs prevalent, neither do they anſwer to our expectation in overcomming the malignitie of the poiſon; ſo that it muſt neceſſarily follow that theſe muſt not onely in qualities, but alſo in quantitie bee ſuperior to poiſons.

Cap. 5. lib. 6. de loc. affect.

The true reaſon of the wondrous effects of poiſons.

CHAP. III.

Whether there bee anie ſuch poiſons as will kill at a ſet time?

TO the propounded queſtion; whether there may bee poiſons which within a certain and definite time (put caſe a month or year) may kill men. *Theophraſtus* thus anſwer's; of poiſons, ſom more ſpeedily perform their parts, others more ſlowly; yet may you finde no ſuch as will kill in ſet limits of time, according to the will and deſire of men. For that ſom kill ſooner or later then others; they do not this of their own or proper nature, as Phyſicians rightly judg, but becauſ the ſubject upon which they light, doth more or leſs reſiſt or yeeld to their efficacie. Experience ſheweth the truth hereof; for the ſame ſort of poiſon in the ſame weight and meaſure given to ſundrie men of different tempers and complexions, will kill one in an hour, another in ſix hours, or in a daie, and on the contrarie will not ſo much as hurt ſom third man. You may alſo obſerv the ſame in purgeing medicines. For the ſame purge given to diverſ men in the ſame proportion, will purge ſom ſooner, ſom later, ſom more ſparingly, others more plentifully, and otherſom not at all; alſo with ſom it will work gently, with otherſom with pain and gripeings. Of which diverſitie, there can no other cauſ bee aſſigned, then men's different natures in complexion and temper, which no man can ſo exactly know and comprehend, as to have certain knowledg thereof, as how much and how long the native heat can reſiſt and labor againſt the ſtrength of the poiſon, or how pervious or open the paſſages of the bodie may bee, whereby the poiſon may arrive at the heart and principal parts. For in ſuch (for example

No poiſons kill in a ſet time.

How poiſons com ti kill ſooner or later.

xample ſake) as have the paſſages of their arteries more large, the poiſon may more readily & ſpeedily enter into the heart together wᵗʰ the air that is continually drawn into the bodie.

CHAP. IV.

Whether ſuch creatures as feed upon poiſonous things bee alſo poiſonous; and whether they may bee eaten ſafely and without harm.

Such things as feed upon poiſon may bee eaten without danger.

Ducks, Storks, Herns, Peacocks, Turkies, and other birds, feed upon Toads, Vipers, Aſps, Snakes, Scorpions, Spiders, Caterpillers, and other venemous things. Wherefore it is worthie the queſtioning, whether ſuch like creatures nouriſhed with ſuch food, can kill or poiſon ſuch perſons as ſhall afterward eat them? *Matthiolus* write's that all late Autors, who have treated of poiſons, to bee abſolutely of this opinion, That men may ſafely and without anie danger feed upon ſuch creatures, for that they convert the beaſts into their nature after they have eaten them, and on the contrarie are not changed by them. This reaſon though verie probable, yet doth it not make theſe beaſts to bee wholly harmleſs, eſpecially if they bee often eaten or fed upon. *Dioſcorides* and *Galen* ſeem to maintain this opinion, whereas they write, that the milk, which is nothing elſ then the relented blood of ſuch beaſts as feed upon ſcammonie, hellebore and ſpurge, purgeth violently. Therefore Phyſicians, deſireous to purge a ſucking childe, give purges to the nurſes, whence the milk becomming purgeing, becom's both meat and medicine to the childe. The fleſh of thruſhes, which feed upon Juniper-berries, ſavor's of Juniper. Birds that are fed with worm-wood or garlick, either taſte bitter, or have the ſtrong ſent of garlick. Whiteings taken with garlick, ſo ſmell thereof, that they will not forego that ſmell or taſte by anie ſalting, frying or boiling; for which ſole reaſon, manie who hate garlick, are forced to abſtain from theſe fiſhes. The fleſh of Rabbits that feed upon pennie-royal and juniper, ſavor of them; Phyſicians wiſh that Goats, Cows and Aſſes, whoſe milk they would uſe for Conſumptions or other diſeaſes, ſhould bee fed ſom ſpace before, and everie daie wᵗʰ theſe or theſe herbs wᶜʰ they deem fit for the cureing of this or that diſeaſ. For *Galen* affirm's that hee doubt's not, but that in ſucceſs of time the fleſh of creatures will bee changed by the meats whereon they feed, and at length ſavor thereof. Therefore I do not allow that the fleſh of ſuch things as feed upon venemous things, ſhould bee eaten for food, unleſs it bee ſom long ſpace after they have diſuſed ſuch repaſte, and that all the venom bee digeſted and overcom by the efficacie of their proper heat, ſo that nothing thereof may remain in taſte, ſmell or ſubſtance, but bee all vaniſhed away. For manie die ſuddenly, the cauſ of whoſe deaths are unknown, which peradventure was from nothing elſ, but the ſympathie and antipathie of bodies, for that theſe things cauſ death and diſeaſ to ſom, that nouriſh otherſom [according to our vulgar Engliſh proverb; *That which is one man's meat, is another man's poiſon.*]

Lib. de ſimp. facult.

The occaſion of ſudden death in manie.

CHAP. V.

The general ſigns of ſuch as are poiſoned.

Common ſigns of ſuch as are poiſoned.

Wee will firſt declare what the general ſigns of poiſon are, and then wee will deſcend to particulars, whereby wee may pronounce that one is poiſoned with this or that poiſon. Wee certainly know that a man is poiſoned, when as hee complain's of a great heavineſs of his whole bodie, ſo that he is wearie of himſelf; when as ſom horrid and loathſom taſte ſweat's out from the orifice of the ſtomach to the mouth and tongue, wholly different from that taſte; that meat, howſoever corrupted, can ſend up: when as the color of the face changeth ſuddenly, ſomwhiles to black, ſom times to yellow, or anie other color, much differing from the common cuſtom of man; when nauſeouſneſs with frequent vomiting, troubleth the patient, and that hee is moleſted with ſo great unquietneſs, that all things may ſeem to bee turned upſide down. Wee know that the poiſon work's by the proper, and from the whole ſubſtance, when as without anie manifeſt ſenſ of great heat or coldneſs, the patient ſwound's often with cold ſweats, for uſually ſuch poiſons have no certain and diſtinct part wherewith they are at enmitie, as *cantharides* have with the bladder. But as they work by their whole ſubſtance, and an occult proprietie of form; ſo do they preſently and directly aſſail the heart, our eſſence and life, and the fortreſs and beginning of the vital faculties. Now will wee ſhew the ſigns whereby poiſons, that work by manifeſt and elementarie qualities, may bee known.

Signs of hot poiſons.

Thoſe who exceed in heat, burn or make an impreſſion of heat in the tongue, the mouth, throat, ſtomach, guts, and all the inner parts, with great thirſt, unquietneſs, and perpetual ſweats. But if to their exceſs of heat they bee accompanied with a corrodeing and putrefying qualitie, as Arſenick, *Sublimate*, Roſe-ager or Ratſ-bane, Verdegreace, Orpiment, and the like, they then cauſ in the ſtomach

stomach and guts intolerable pricking pains, rumblings in the bellie, and continual and intolerable thirst. These are succeeded by vomitings, with sweats somwhiles hot, somwhiles cold, with swoundings, whence sudden death ensue's. Poisons that kill by too great coldnes, induce a dull or heavie sleep, or drowzines, from which you cannot easily rouz or waken them; somtimes they so trouble the brain, that the patients perform manie undecent gestures and antick tricks with their mouths and eies, arms and legs, like as such as are frantick; they are troubled with cold sweats, their faces becom blackish or yellowish, alwaies ghastlie, all their bodies are benummed, and they die in a short time unless they bee helped; poisons of this kinde are Hemlock, Poppie, Night-shade, Henbane, Mandrag. Drie poisons are usually accompanied by heat with moisture, for although *sulphur* bee hot and drie, yet hath it moisture, to hold the parts together, as all things which have a consistence have; yet are they called drie, by reason that drines is predominant in them: such things make the tongue and throat drie and rough, with unquenchable thirst; the bellie is so bound, that so much as the urine cannot have free passage forth; all the members grow squalid by drines, the patients cannot sleep: poisons of this kinde are Lytharge, Cerus, Lime, scales of Brass, fileings of Lead, prepared antimonie. On the contrarie, moist poisons induce a perpetual sleep, a flux or scouring the resolution of all the nervs and joints, so that not so much as the eies may bee faithfully contained in their orbs, but will hang as readie to fall out; the extreme parts, as the hands, feet, nose and ears corrupt and putrefie, at which time they are also troubled with thirst by reason of their strong heat, alwaies the companion of putrefaction, and oftimes the autor thereof: now when this commeth to pass, death is at hand. Verie manie denie that there can bee anie moist poisons found, that is, such as may kill by the efficacie of their humiditie, becaus there are no such things to bee found, as may com to the fourth degree of moisture. Yet there is an example that averr's the contrarie, which was of one, who sleeping on the night, was bitten by a Serpent, as *Gilbertus Anglicus* affirmeth; for dying thereof, when as his servant, desirous to awaken his Master out of his sleep, took him by the arm, all the flesh beeing putrefied, fell off, and presently the bones also fell asunder, beeing deprived of their flesh, which could not happen, unless by exces of the venemous humiditie which lay hidden in the teeth and spittle of the serpent. Also wee have found it noted by *Hippocrates*, that in a rainie, humid and southerly constitution of the year, it happened by the malign violence of the venenate and putrefying humiditie, that the flesh of the arms and legs becomming rotten, fell away by peece-meal, and the bones remained bare; yea also and the bones themselvs in som putrefied and fell away; neither doth the *Lues Venerea* kill by anie other means, then by a fretting and putrefying force of humiditie, by whose efficacie the soliditie of the bones is dissolved; then much more the flesh may bee tainted and consumed by putrefaction.

Signs of cold poisons.

Signs of drie poisons.

Signs of moist poisons.

An historie.

Sett. 3. Lib. 3 epid.

The *Lues Venerea* kill's by exces of moisture.

To these and such poisons which work by a manifest and elementarie facultie, when as they shall bee received into the bodie after what manner soever, you shall forthwith oppose their contraries, and if by chance it bee not manifest, what, and of what distinct kinde of poison that is, you must know that such poisons as work by occult properties, it is not by reason as yet found out how they will affect the bodie, but onely by experience. Therefore to these you must oppose their like antidotes, which may by their whole substance strengthen the heart and vital facultie, and withstand the strength of the poison. But to this our distinction of poisons, working by a manifest and elementarie qualitie, their opinion is contrarie, who affirm that the venom of all poisonous beasts are therefore cold, for that such as are bitten or stung with them, are forthwith felt to bee colder then a stone. And that serpents for fear of cold, when as winter is at hand, keep themselvs in holes and dens under ground, or else, as vipers use to do, lie under stones; under which, you may often finde them stiff and numb, and so unapt for motion, that you may easily take them up in your hand. But the coldnes that is perceived or felt in such as are bitten or stung, is not occasioned by the coldnes of the poison, but by the absence of the natural heat, withdrawing it self in the verie instant of the stroak, from the surface into the center of the bodie, both for the defence of the heart, as the principal part; as also for that there is nothing which so much dissipate's, or so much oppugn's the vital heat, as poison, of what kinde soever it bee, doth.

All poisons are not cold.

Why such, as are poisoned or stung, are cold.

CHAP. VI.

How, or by what means to shun, or eschew Poisons.

IT is a matter of much difficultie to avoid poisons, becaus such as at this time temper them, are so throughly prepared for deceit and mischief, that they will deceiv even the most warie and quick-sighted; for they so qualifie the ingrate taste and smell, by the admixture of sweet and well-smelling things, that they cannot easily bee perceived even by the skilful. Therefore such as fear poisoning, ought to take heed of meats cooked with much art, verie sweet, salt, sowr, or notably endued with anie other taste. And when they are oppress with hunger or thirst, they

What, such as fear poisoning, must observ in their diet.

they muſt not eat nor drink too greedily, but have a diligent regard to the taſte of ſuch things as they eat or drink; beſides, before meat let them take ſuch things as may weaken the ſtrength of the poiſons; ſuch as is the fat broth of good nouriſhing fleſh-meats; in the morning let them arm themſelvs with treacle or mithridate, and conſerv of roſes, or the leavs of rue, a walnut and drie figs; beſides, let him preſently drink a little draught of muſkedine or ſom other good wine; when one ſuſpects hee hath taken any poiſon in meat or drink, let him forbear ſleeping. For beſides that the force of poiſon is oft times ſo rapid, that it conſume's our life in a ſhort ſpace, as fire doth ſtubble, as alſo for that it is drawn more inwardly into the ſecret paſſages of the bodie by ſleep. Wherefore in ſuch a caſe it is better to procure vomit by drinking *Hydreleum* warm, or butter diſſolved in warm oil, or a decoction of line, or fenugreek-ſeeds, or fat broth, for thus the received poiſon is alſo caſt forth therewith, or elſ the acrimonie thereof retunded, and the bellie looſed.

Why ſleep is hurtfull.

Why and how vomit muſt bee procured.

You may ſee this by dailie experience, for cauſticks, veſicatories, and the like acrid things beeing applied to an anointed part, will not bliſter nor exulcerate the part. Neither doth the vomit conduce onely in this, that it excludeth the poiſon, but it ſhew's either by the taſte, ſmell, or color, the kinde of the taken-poiſon; ſo that then by uſeing the proper Antidote, it may bee the more eaſily and ſpeedily reſiſted, yet notwithſtanding if you conceiv that the poiſon have deſcended deeper in the Guts, you may with a glyſter draw away the reſt thereof which adher's to the coats of the Guts. But if the patient cannot vomit, then ſhall ſom purgeing medicine bee given him forthwith, and ſuch as are thought more particularly to reſiſt poiſon, ſuch as are Agarick, Aloës, the leſſer Centaurie, Rubarb and other things, according to the direction of the learned Phyſician. Then ſhall you adminiſter glyſters made with *Caſſia*, fattie decoctions, ſheep-ſuet, or butter or Cowſ-milk, with the mucilages of Line-ſeed, *pſilium*-ſeeds, quince-ſeeds, and other ſuch things as are uſually given in a Dyſenterie, or bloodie flux, that ſuch things may hinder the adheſion of the poiſon to the coats of the Guts, and by their unctuouſneſs retund the acrimonie of the poiſon, and mitigate if anie thing ſhall alreadie bee ulcerated, and abſolutely defend the ſound parts from the malign effects of the poiſon. But let this bee a perpetual rule, That the poiſon bee ſpeedily drawn back by the ſame way it entred into the bodie; as, if it entred by ſmelling in at the noſtrils, let it bee drawn back by ſneeſing, if by the mouth into the ſtomach, let it bee excluded by vomit; if by the fundament into the bellie, then by glyſter; if by the privities into the womb, then by *metrenchites* or injections made thereinto; if by a bite, ſting or wound, let revulſion bee made by ſuch things as have a powerful attractive faculti; for thus wee make diverſions, that by theſe wee may not onely hinder the poiſon from aſſailing the heart, but alſo that by this means wee may draw it from within outwards. Wherefore ſtrong ligatures caſt about the arms, thighs and legs, are good in this caſe. Alſo large cupping glaſſes applied with flame to ſundrie parts of the bodie are good. Alſo bathes of warm water, with a decoction of ſuch things as reſiſt poiſon, ſouthern-wood, calamint, rue, betonie, horehound, pennie-royall, bayes, *ſcordium*, ſmallage, ſcabious, mints, valerian, and the like, are good in this caſe. Alſo ſweats are good, beeing provoked ſo much as the ſtrength of the patient can endure. But if hee bee verie wealthie, whom wee ſuſpect poiſoned, it will bee ſafer to put him into the bellie of an ox, horſ or mule, and then preſently into another aſſoon as the former is cold, that ſo the poiſon may bee drawn forth by the gentle and vaporous heat of the new killed beaſt; yet do none of theſe things without the advice of a Phyſician, if it may conveniently bee had.

When and wherewith they ſhall bee purged.

The cure of poiſoned wounds.

CHAP. XIIII.

How the corrupt or venemous Air may kill a Man.

By how manie, and what means the air may bee infected.

THE air is infected and corrupted by the admixture of malign vapors, either ariſeing from the unburied bodies of ſuch as are ſlain in great conflicts, or exhaleing out of the earth after earth-quakes, for the air, long pent up in the cavities and bowels of the earth, and deprived of the freedom & commerce of the open air, is corrupted, and acquires a malign qualitie, which it preſently transferreth unto ſuch as meet therewith. Alſo there is a certain malignitie of the air, which accompanieth thunders, and lightnings, which favours of a ſulphureous virulencie, ſo that whatſoever wilde beaſts ſhall devour the creatures killed therewith, they becom mad, and die immediately; for the fire of lightning hath a far more rapid, ſubtil, and greater force then other fires, ſo that it may rightly bee termed a Fire of Fires.

How thunders and lightnings may infect the air.

An argument hereof is, that it melteth the head of a ſpear, not harming the wood, and ſilver and gold, not hurting the purſ wherein it is contained. Alſo the air is infected by fumigations, which preſently admitted into the bodie and bowels by the mouth and noſe in reſpiration, by the skin and arteries in perſpiration, doth eaſily kill the ſpirits and humors beeing firſt infected, and then within a ſhort ſpace after, the ſolid ſubſtance of the principal parts, and chiefly of the heart beeing turned into their nature, unleſs the man bee firſt provided

provided for by ſneeſing, vomiting, ſweating, purgeing by the bellie, or ſom other excretion. For that poiſon which is carried into the bodie by ſmell, is the moſt rapid and effectuall, by ſo much as a vapor or exhalation is of more ſubtil and quicklier-piercing eſſence then an humor. Yet notwithſtanding, wilt thou ſay, it is not credible, that anie bee kill'd by anie vapor raiſed by the force of fire, as of a torch, or a warming-pan, for that the venenate qualitie of the thing that is burnt, is diſſipated and conſumed by the force of the fire, purgeing and cleanſing all things. This reaſon is falſly feigned to the deſtruction of the lives of careleſs people; for ſulphureous brands kindled at a clear fire, do notwithſtanding caſt forth a ſulphureous vapor. Whether do not *Lignum aloës* and Juniper, when they are burnt in a flame, ſmell leſs ſweetly?

Whether the vapor that ariſeth from a burnt thing may poiſon one.

Pope *Clement*, the ſeventh of that name, the uncle of our Kings mother, was poiſoned by the fume of a poiſonous torch that was carried lighted before him, and died thereof. *Mathiolus* telleth, that there were two Mountebanks in the market-place of *Sienna*, the one of which but ſmelling to a poiſoned gillie-flower given him by the other, fell down dead preſently.

An hiſtorie.

A certain man not long ago, when hee had put to his noſe, and ſmelled a little unto a pomander, which was ſecretly poiſoned, was preſently taken with a *Vertigo*, and all his face ſwelled, and unleſs that hee had gotten ſpeedie help by ſternutatories and other means, hee had died ſhortly after of the ſame kinde of death that Pope *Clement* did.

The ſafeſt preſervative againſt ſuch poiſons is, not to ſmell to them: moreover, ſom affirm, that there are prepared ſom poiſons of ſuch force, that beeing annointed but on the ſaddle, they will kill the rider, and others, that if you but annoint the ſtirrups therewith, they will ſend ſo deadlie poiſonous a qualitie into the rider, through his boots, that hee ſhall die thereof within a ſhort time after: which things, though they bee ſcarce credible, becauſ ſuch poiſons touch not the naked skin, yet have they an example in nature, whereby they may defend themſelvs. For the *Torpedo* ſend's a narcotick, and certainly deadly force into the arm, and ſo into the bodie of the fiſher, the cords of the net beeing between them.

CHAP. VIII.

That everie kinde of poiſon hath its proper and peculiar Signs and Effects.

AS poiſons are diſtinct in *ſpecies*, ſo each *ſpecies* differ's in their ſigns and effects; neither is it poſſible to finde anie one kinde of poiſon, which may bee accompanied or produce all the ſigns and effects of all poiſons, otherwiſe Phyſicians ſhould in vain have written of the ſigns and effects of each of them, as alſo of their proper remedies and antidotes. For what kinde of poiſon ſhall that bee, which ſhall cauſ a burning heat in the ſtomach, bellie, liver, bladder and kidnies, which ſhall cauſ a hicketting, which ſhall cauſ the whole bodie to tremble and ſhake, which ſhall take away the voice and ſpeech, which ſhall cauſ convulſions, ſhall weaken the pulſifick faculties, which ſhall intercept the freedom of breathing, which ſhall ſtupefie and caſt into a dead ſleep, which ſhall together, and at once cauſ a *Vertigo* in the head, dimneſs in the ſight, a ſtrangling, or ſtoppage of the breath, thirſt, bleeding, fever, ſtoppage of the urine, perpetual vomiting, redneſs, lividneſs, and paleneſs of the face, reſolutions of the powers, and manie other things, all which are cauſſed by all ſorts of poiſon. Laſtly, no bodie will denie but that hot poiſons may kill more ſpeedily then cold, for that they are more ſpeedily actuated by the native heat.

Hot poiſons kill ſooner then cold.

CHAP. IX.

The Effects of poiſons from particular venemous things, and what Prognoſticks may thence bee made.

IT is the opinion of *Cornelius Celſus*, and almoſt of all the Antients, that the bite of everie beaſt had ſom virulencie, but yet ſom more then other-ſom. They are moſt virulent that are inflicted by venemous beaſts, as Aſps, Vipers, Waterſnakes, and all kindes of Serpents, Baſilisks, Dragons, Toads, mad Dogs, Scorpions, Spiders, Bees, Waſps, and the like. They are leſs malign, which are of creatures wanting venom, as of Horſes, Apes, Cats, Dogs not mad, and manie other things, which though of their own nature they are without poiſon, yet in their bites there is ſomthing more dolorifick and ill natured, then in common wounds inflicted by other occaſions: I beleev, that in their ſlaver or *ſanies*, there is ſomthing, I know not how to term it, contrarie to our nature, which imprint's a malign qualitie in the ulcer, which alſo you may obſerv in the tearings and ſcratchings of ſuch creatures as have ſharp claws, as Lions and Cats. Moreover manie affirm, that they have found by experience, that the bites of men are not altogether without virulencie, eſpecially of ſuch as are red-haired & freckled, chiefly when

Lib. 2. cap. 27. The bites of all wilde beaſts are virulent.

The bites of a red-haired man virulent.

when as they are angred; it is probable that the bites of other persons want this maligoitie, seeing that their spittle will cure small ulcerations. Wherefore, if there shall happen difficultie of cure in a wound, caused by a man's biteing, which is neither red haired nor freckled, neither angrie; this happen's not by means of the spittle, nor by anie malign qualitie, but by reason of the contution, caused by the bluntness of the teeth, not cutting, but bruising the part, for beeing not sharp, they cannot so easily enter the flesh, unless by bruising and tearing, after the manner of heavie and blunt strokes and weapons, wounds beeing occasioned by such are more hard to bee cured, then such as are made by cutting and sharp weapons. But of the fore-said biteings of venemous creatures, there are few which do not kill in a short space, and almost in a moment, but principally if the poison bee sent into the bodie by a live creature, for in such poison there is much heat; also there is therein a greater tenuitie, which serv's as *vehicles* thereto into what place or part soever of the bodie they tend, the which the poisons taken from dead creatures are defective of. Wherefore som of these kill a man in the space of an hour, as the poison Asps, Basilisks and Toads; others not unless in two or three daies space, as of water-Snakes; a Spider, and Scorpion require more time to kill, yet all of them admitted but in the least quantitie, do in a short space cause great and deadlie mutations in the bodie, as if they had breathed in a pestiferous air, and with the like violence, taint and change into their own nature all the members and bowels, by which these same members do in the time of perfect health change laudable meats into their nature and substance. The place whereas these poisonous creatures live, and the time, conduce to the perniciousness of the poison, for such as live in drie, mountainous, and sun-burnt places kill more speedily then such as bee in moist and marish grounds; also they are more hurtful in winter then in summer; and the poison is more deadly which proceed's from hungrie, angrie and fasting creatures, then that which com's from such as are full and quiet; as also that which proceed's from young things, chiefly when as they are stimulated to venerie, is more powerful then that which com's from old and decrepit; from femals worse then from males; from such as have fed upon other venemous things, rather then from such as have abstained from them, as from snakes which have devoured toads, vipers which have fed upon scorpions, spiders and Caterpillers. Yet the reason of the efficacie of poisons depend's from their proper, that is, their subtil or gross consistence, and the greater or less aptness of the affected bodie to suffer. For hot men that have larger and more open veins and arteries, yeeld the poison freer passage to the heart. Therefore they which have more cold and straight vessels, are longer ere they die of the like poison; such as are full, are not so soon harmed as those that are fasting: for meats, besides that by filling the vessels, they give not the poison so free passage, they also strengthen the heart by the multiplication of spirits, so that it more powerfully resist's pernicious venom. If the poison work by an occult and specifick propertie, it causeth the cure and prognostick to bee difficult, and then must wee have recourse to Antidotes, as these which in their whole substance resist poisons; but principally to treacle, becaus there enter into the composition thereof medicines which are hot, cold, moist and drie: whence it is, that it retund's and withstand's all poisons, chiefly such as consist of a simple nature, such as these which com from venemous creatures, plants and minerals; and which are not prepared by the detestable art of empoisoners.

Contused wounds harder to heal then such as are cut.

Why treacle retund's the force of all simple poisons.

CHAP. X.

What cure must bee used to the biteings and stingings of venemous beasts.

CUre must speedily bee used without anie delaie to the bites and stingings of venemous beasts, which may by all means disperse the poison, and keep it from entering into the bodie; for when the principal parts are possessed, it boot's nothing to use medicines afterwards. Therefore the Antients have propounded a double indication to lead us to the findeing out of medicines in such a case, to wit, the evacuation of the virulent and venenate humor, and the change or alteration of the same and the affected bodie. But seeing evacuation is of two sorts, to wit, *universal*, which is by the inner parts; and *particular*; which is by the outward parts. Wee must begin at the particular, by such to pick medicines as are fit to draw out, and retund the venom; for wee must not alwaies begin a cure with general things, as som think, especially in external diseases, as wounds, fractures, dislocations, venemous bites and punctures. Wherefore hereto as speedily as you may, you shall applie remedies fit for the bites and punctures of venemous beasts; as for example, the wounds shall bee presently washed with urine, with sea-water, *aqua vitæ*, or wine, or vineger wherein old treacle or mustard shall bee dissolved. Let such washing bee performed verie hot, and strongly chafed in, and then leav upon the wound and round about it, linnen rags, or lint steeped in the same liquor. There bee som who think it not fit to lay treacle thereto, becaus, as they say, it drive's the poison in. But the authoritie of *Galen* convinceth that opinion, for hee writeth that if treacle bee applied to this kinde of wounds before

A double indication in the cure of venemous bites.

Lotions fit for venemous bites.

Lib. de theriaca.

before that the venom ſhal arrive at the noble parts, it much conduceth. Alſo reaſon confutes it; for viper's fleſh enters the compoſition of treacle which attracts the venom by the ſimilitude of ſubſtance, as the Load-ſtone draweth iron, or Amber ſtraws. Moreover, the other ſimple medicines which enter this compoſition, reſolv and conſume the virulencie and venom, and beeing inwardly taken, it defendeth the heart and other noble parts, and corroborateth the ſpirits. Experience teacheth that mithridate fitly given in the ſtead of treacle worketh the like effect. The medicines that are taken inwardly and applied outwardly for evacuation, muſt bee of ſubtil parts, that they may quickly inſinuate themſelvs into everie part to retund the malignitie of the poiſon; wherefore garlick, onions, leeks, are verie good in this caſe, for that they are vaporous; alſo *ſcordium*, *Rue*, *dictamnus*, the leſſer Centaurie, hore-hound, *Rocket*, the milkie juice of unripe figs, and the like, are good; there is a kinde of wilde bugloſs amongſt all other plants, which hath a ſingular force againſt venemous bites, whence it is termed *Echium* and *viperinum*, and that for two cauſſes; the firſt is, becauſ in the purple flowers that grow amongſt the leav's, there is a reſemblance to the head of a viper or adder. Another reaſon is, becauſ it heal's the biting of a viper not onely applied outwardly, but alſo helpeth ſuch as are bitten, beeing drunk in wine, yea, and will not ſuffer thoſe that have lately drunk thereof to bee bitten at all. Wilde *Time* hath the like effect; though theſe oft-times agree with the poiſon in qualitie as in heat, yet do they help in diſcuſſing and reſolving it; yet, as much as wee may, wee muſt labor to have evacuation and alteration together. It is moſt convenient, if the part affected will permit, to applie large cupping-glaſſes with much flame and horns; alſo ſucking is good, the mouth beeing firſt waſhed in wine wherein ſome treacle is diſſolved, and with oil, leſt any thing ſhould adhere thereto, for it will hinder it, if ſo bee the mouth bee no where ulcerated. It is good alſo to applie horſ-leeches; ſom wilh to applie to the wound, the fundaments of hens or turkies that lay egs, for that ſuch are opener behinde, firſt putting ſalt upon them that they may gape the wider, ſhutting their beaks and opening them now and then leſt they ſhould bee ſtifled, and ever and anon to ſubſtitute others inſtead of ſuch as die or are ſuffocated; for thus it is thought the poiſon is drawn forth, and paſſeth into the bird by the fundament. There bee others which had rather applie to the wound live birds cut aſunder in the midſt, and ſo laid to hot, for that they gheſs theſe reſiſt poiſon by a natural diſcord. But certainly it is by their heat whereby they do not onely digeſt toads, aſps, vipers, ſcorpions and other venemous things, but alſo wear aſunder and ſoften ſand, ſtones, and moſt drie and ſtonie ſeeds in their gizzards; wherefore wee muſt think them very good to draw out the poiſon and diſſipate it. But nothing is ſo forcible to diſperſ and retund the venom, as the impreſſion of cauteries, eſpecially actual, for a hot iron works more effectually and ſpeedily, and cauſſeth an ulcer which will remain open a longer time. Wherefore to cauſ the ſpeedier falling away of the Eſchar, you ſhall ſcarifie it to the quick, and then plentifully annoint the place. For thus the poiſon will the ſooner paſs forth. But this muſt bee done before the poiſon enter's far into the bodie, for otherwiſe Cauteries will not onely do no good, but further torment the patient, and weaken him to no purpoſe. Let drawing plaſters bee laid to the wound and neighboring parts, made of *Galbanum*, turpentine, black pitch, and other gummie and reſinous things. After the falling away of the Eſchar, *baſilicon* ſhall bee applied, quickned with a little *Precipitate*, for it is very effectual in theſe caſes, for that it draweth forth the virulent *ſanies* out of the bottom of the wound, neither doth it ſuffer the wound to bee cloſed ſpeedily. To which purpoſe they put in a piece of a ſponge, or a root of Gentian or Hermodactyl, or ſom acrid medicine, as *ægyptiacum*, or *Precipitate* mixed with the powder of Alum, or a cauſtick beaten to powder. But you muſt alwaies obſerv this, that with your ointments you muſt alwaies mix ſom Treacle or Mithridate, or the juice of *hypericon*, or the like, which have power to attract and diſperſ the poiſon, and cleanſ the ulcer; yet if too vehement heat ſhall cauſ ſuch pain as is likely to bring a gangren by the diſſipation of the ſpirits, then neglecting the cure of the proper diſeaſ for a time, wee muſt labor to correct the ſymptom. But in this caſe you muſt obſerv this rule, that you let no blood, give no purgeing medicine, nor glyſter, nor vomit, nor uſe no bath, nor other thing that may procure ſweat, untill three daies bee paſt after the bite or ſting. In the mean ſpace let the patient ſhun all manner of labor, but chiefly venerie, leſt by cauſing an agitation of the humors, the poiſon get ſooner to the heart. Therefore then it is time to uſe univerſal evacuations, when as you ſhall ſuſpect that the poiſon is diffuſed over the veins and whole inner part of the bodie beſides. Before you ſhall give nothing, unleſs medicines of Treacle or Mithridate and the like things, which have a faculltie to reſiſt poiſon, and ſtrengthen the whole bodie by their benign and vital vapor, although their ſubſtance go no further then the ſtomach. Thus pills when they are ſwallowed, though they go no further then the ſtomach, yet do they draw matter out of the joints and head; and ſtrong glyſters, though they paſs no further then the guts, yet by their qualitie diffuſed further with the vapor, they draw from the moſt diſtant parts; yet you muſt give an Antidote, not onely more powerfull then the poiſon in qualitie, but alſo greater in quantitie, that ſo it may the more eaſily overcom and exſpell the poiſon. Wherefore you muſt give it twice in a daie, and

Treacle outwardly applied and inwardly taken good againſt venemous bites.

The force of *Echium*.

The efficacie of Cauteries againſt venemous bites.

The force of *Precipitate* againſt venemous wounds.

When hot things are not convenient for poiſoned wounds.

Antidotes muſt bee given in great quantities.

and continue it ſo long untill you ſhall know that the ſtrength of the poiſon is weakned and overcom by the remiſſion and decay of the malign ſymptoms. Yet in the mean while, you muſt not neglect the diſtemper cauſſed in the part by the poiſon, but muſt rather correct it by the application of the remedies contrarie to the diſtemper, as by cold things, if great heat afflict the affected part and whole bodie; by hot things on the contrarie, if it ſeem as cold as a ſtone, which oft-times happen's. And let thus much ſuffice for the general cure of poiſons: now will wee com to their particular cure.

CHAP. XI.

Why dogs ſooner becom mad then other creatures, and what bee the ſigns thereof.

Dogs naturally ſubject to madneſs.

DOgs becom mad ſooner then other creatures, becauſ naturally they injoy that temper and condition of humors which hath an eaſie inclination to that kinde of diſeaſ, and as it were a certain diſpoſition, becauſ they feed upon carrion and corrupt, putrid and ſtinking things, and lap water of the like condition; beſides the trouble and vexation of loſing their maſters, make's them to run everie waie, painfully ſearching and ſmelling to everie thing, and neglecting their meat. A heating of the blood enſue's upon this pain, and by this heat it is turned into a melancholie, whence they becom mad. But yet dogs do not alwaies becom mad by means of heat, but alſo by occaſion of cold, that is, by contrarie cauſſes; for they fall into this diſeaſ not onely in the dog-daies, but alſo in the depth of winter. For dogs abound with melancholik humors, to wit cold and drie. But ſuch humors as in the ſummer through exceſs of heat, ſo in the depth of winter by conſtipation and the ſuppreſſion of ſuliginous excrements, they eaſilie turn into melancholie. Hence follow's a verie burning and continual feaver, which cauſſeth or bringeth with it a madneſs. Add hereto, that in the depth of winter the heat which is contained within is redoubled, and in like manner as the ſcorching heat in ſummer, it breed's and turn's the humors into melancholie. Alſo dogs becom mad by contagion, as ſuch as are bitten by another mad dog. A mad dog hath ſparkling and fierie eies, with a fixed look, cruel and a ſquint, hee carrie's his head heavily, hanging down towards the ground, and ſomwhat on one ſide, hee gape's, and thruſt's forth his tongue, which is livid and blackiſh; and beeing ſhort breathed, caſt's forth much filth at his noſe, and much foaming matter at his mouth; in his gate, as if hee ſuſpected and feared all things, hee keepeth no one or certain path, but run's one while to this ſide, another while to that, and ſtumbling like one that is drunk, hee oft-times falleth down on the ground; hee violently aſſail's whatſoever hee meet's withall, whether it bee man, tree, wall, dog, or any thing elſ; other dogs ſhun him, and preſently ſent him a far off. But if another unawars chance to fall foul on him, hee yeeld's himſelf to his mercy, fawn's upon him, and privily labor's to get from him, though hee bee the ſtronger and greater. Hee is unmindful of eating and drinking, hee bark's not, yet hee bite's all hee meet's without anie difference, not ſpareing his maſter, as who at this time hee know's not from a ſtranger or enemie. For it is the propertie of melancholie to diſturb the underſtanding, ſo that ſuch perſons as are melancholick, do not onely rage againſt, and uſe violence to their friends and parents, but alſo upon themſelvs. But when as hee ſee's water, hee tremble's and ſhake's, and his haires ſtand up on end.

Dogs becom mad, not onely in the heat of ſummer, but alſo in the depth of winter.

Why melancholick perſons hurt themſelvs.

CHAP. XII.

By what ſignes wee may know a man is bitten by a mad dog.

The bite of a mad dog not verie painful at the firſt.

IT is not ſo eaſie at the firſt to know a man that is bitten with a mad dog; and principally for this reaſon, becauſ the wound made by his teeth cauſſeth no more pain then other wounds uſually do; contrarie to the wounds made by the ſting or bite of other poiſonous creatures, as thoſe which preſently after they are inflicted, cauſ ſharp pain, great heat, ſwelling and abundance of other malign accidents, according to the nature of the poiſon; but the malignitie of the bite of a mad dog appear's not before that the venom ſhall invade the noble parts. Yet when you are ſuſpicious of ſuch a wound, you may acquire a certain knowledg and experience thereof by putting a piece of bread into the quitture that come's from the wound. For if a hungrie dog neglect, yea more flie from it, and dare not ſo much as ſmell thereto, it is thought to bee a certain ſign that the wound was inflicted by a mad dog. Others add, That if anie give this piece of bread to hens, that they will die the ſame daie they have eaten it; yet this later, I makeing experiment thereof, failed, for devouring this virulent bread, they became not a jot the worſ. Wherefore I think the former ſign to bee the more certain, for dogs have a wonderful and ſure ſmelling faculti e, whereby they ſent and perceiv the malignitie of the like creature. But when as the rageing

Signs of the bite of a mad dog.

virulencie

virulencie hath invaded the noble parts, then the patients, becomming silent and sorrowful, think of manie things, and at the beginning make a noise with their teeth; they make no answer to the purpose, they are more testie then ordinarie, and in their sleeps they are troubled with dreams, and strange phantasies, and fearful visions: and lastly, they becom affraid of the water. But after that the poison hath fixed it self into the substance of the noble parts, then all their faculties are disturbed, all the light of their memorie, senses, reason and judgment is extinguished. Wherefore becomming stark mad, they know not such as stand by them, nor their friends, no nor themselvs, falling upon such as they meet withall and themselvs with their teeth, and nails, and feet. Often twitchings like convulsions do suddenly rise in their limbs; I judg them occasioned by extraordinarie driness, which hath as it were wholly drunk up all the humiditie of the nervous parts; there is a great driness of the mouth with intolerable thirst, yet without anie desire of drink, becaus the minde beeing troubled, they becom unmindful and negligent of such things as concern them, and are needful for them; the eies look fierie and red, and all the face is of the same color; they still think of dogs, and seem to see them, yea and desire to bark and bite just after the manner of dogs: I conjecture, that the virulent humor hath changed all the humors and the whole bodie into the like nature, so that they think themselvs also dogs; whence their voice becom's hoarse by much endeavouring to bark, haveing forgot all decencie, like impudent dogs, to the great horror of the beholders. For their voice grow's hoarse by reason of the great driness of the *aspera arteria*; they shun the light, as that which is enemie to melancholie, wherewith the whole substance of the brain is repleniished: on the contrarie, they desire darkness, as that which is like and friendly to them. But they are affraid of the water (though good to mitigate their great distemper of heat and driness) and they flie from looking-glasses, becaus they imagin they see dogs in them, whereof they are much affraid, by reason whereof they shun the water, and all polite and clear bodies which may supplie the use of a looking-glass; so that they throw themselvs on the ground, as if they would hide themselvs therein, lest they should bee bitten again: for they affirm, that hee which is bitten by a mad dog, alwaies hath a dog in his mind, and so remain's fixed in that sad cogitation. Wherefore thinking that hee see's him in the water, hee tremble's for fear, and therefore shun's the water. Others write, that the bodie by madness becommeth wondrous drie, wherefore they hate the water, as that which is contrarie thereto, beeing absolutely the moistest element, and so they say that this is the reason of their fearing the water. *Ruffus* write's, that madness is a kinde of melancholie, and that fear is the proper symptom thereof, according to *Hippocrates*; wherefore this or that kinde of melancholie beget's a fear of these or these things, but chiefly of bright things, such as looking-glasses and water, by reason that melancholick persons seek darkness and solitarines; by reason of the black corruption of the humor wherewith they abound. They fall into cold sweats, a fomie, stinking and greenish matter flow's from the ulcer, by reason of the heat of the antecedent cauf and ulcerated part. The urine most commonly appear's watrish, by reason that the strainers, as it were, of the kidnies, are straightned by the heat and driness of the venom. Yet somtimes also it appear's more thick and black, as when nature powerfully using the expulsive facultie, attempt's to drive forth by urine the melancholick humor, the seat of the venom. Also somtimes it is wholly suppresst, beeing either incrassated by hot driness, or elf the minde beeing carried other-wales, and forgetful of its own dutie, until at length the patients, vexed by the crueltie of so manie symptoms, and overcom by the bitterness of pain, die frantick, by reason that medicines have not been speedily and fitly applied. For few of those who have used remedies in time, have perished of this disease.

Signs, by which you may gather that the noble parts are tainted.

Why men becomming mad bark like dogs.

Why they shun the light.

Why they are affraid of the water.

Aphor. 25. sect. 6.

The bite of a mad dog taken in hand in time, is for the most part curable.

CHAP. XIII.

Prognosticks.

WEe cannot so easily shun the danger wee are incident to by mad dogs, as that of other beasts, by reason hee is a domestick creature, and housed under the same roof with us. The virulencie that reside's in his foam or slaver is hot and drie, malign, venenate and contagious, so that it causseth a distemper like to it self, in the bodie whereto it shall applie it self, and spread it self over the whole bodie by the arteries; for it doth not onely hurt when as it is taken in by a bite or puncture, but even applied to the skin, unless it bee forthwith washed away with salt water or urine. Neither doth this venom hurt equally, or at all times alike, for it harm's more or less, according to the inclination of the air to heat or cold, the depth of the wound, the strength of the patient's bodie, and the ill humors thereof, and their disposition to putrefaction, the freedom and largeness of the passages. Now malign symptoms happen sooner or later, as in som about the fortieth day, in others about six moneths, and in others a year after. There bee som who thereupon are troubled with the falling-sickness, and at length grow mad: such as fall into a fear of the water, never recover. Yet *Avicen* think's their case is not desperate, if

The venom of a mad dog applied outwardly onely may caus madness.

Whether the *Hidrophobia* or fear of water bee incurable.

if as yet they can know their face in a glaſs; for hence you may gather, that all the animal faculties are not yet overthrown, but that they ſtand in need of ſtrong purgations, as wee ſhall ſhew hereafter. *Aetius* tell's, that there was a certain Philoſopher, who taken with this diſeaſ, and a fear of water, when as hee deſcended with a great courage unto the bath, and in the water beholding the ſhape of the dog that bit him, hee made a ſtand, but aſhamed thereof, hee forthwith cried out, *Quid cani cum Balneo? i.e.* What hath a dog to do with a Bath? which words beeing uttered, hee threw himſelf forcibly into the Bath, and fearleſly drank of the water thereof, and ſo was freed from his diſeaſ together with his erroneous opinion. It is a deadlie ſign to tumble themſelvs on the ground, to have an hoarſ voice, for that is an argument that the weazon is becom rough by reaſon of too exceſſive drineſs. Finally, the principal parts beeing poſſeſſed, there is no recoverie or life to bee hoped for. Men may well fall mad, though they bee not bit by a mad dog. For as the humors are often inflamed of themſelvs, and cauſ a *Cancer* or Leproſie, ſo do they alſo madneſs in melancholick perſons. The bites of vipers and other venemous creatures cauſ not like ſymptoms to theſe that com by the biteing of a mad dog; becauſ they die before ſuch can com forth or ſhew themſelvs. Great wounds made by mad dogs are not equally ſo dangerous as little, for from the former, great plentie of venemous matter flow's out; but in the later, it is almoſt all kept in.

An hiſtorie.

CHAP. XIV.

What cure muſt bee uſed to ſuch as are bitten by a mad dog.

THis caſe alſo require's ſpeedie remedies; for ſuch things are in vain which com long after the hurt. The Lawyer *Baldus* experienced this to his great harm; for beeing by chance lightly bit in the lip by a little dog wherewith hee was delighted, not knowing that hee was mad, and neglecting the wound, by reaſon of the ſmalneſs thereof, after ſom four moneths ſpace, hee died mad, haveing then in vain aſſaied all manner of medicines. Wherefore obſerving theſe things both for evacuation, as alſo for alteration, which wee have formerly mentioned in the general cure of wounds inflicted by the bite or ſting of venemous creatures, and by all the means there ſpecified, wee muſt draw forth the venom; and if the wound bee large, then ſuffer it to bleed long and much, for ſo ſom part of the poiſon will bee exhauſted; if it bee not great, it ſhall bee enlarged by ſcarification, or an occult cauterie, neither ſhall it bee healed or cloſed up at the ſooneſt, till fourtie daies bee paſſed. Sorrel beaten and applied to the wound, and the decoction thereof taken inwardly, is verie effectual in this caſe, as *Aetius* affirm's. To the ſame purpoſe you may with good ſucceſs make a lotion and friction with muſtard diſſolved in urine or vineger, leaving upon the wound a double cloth moiſtned in the ſame decoction: laſtly, all acrid, biteing, and verie attractive medicines are convenient in this caſe. Wherefore ſom applie rocket boiled and beaten with butter and ſalt; others take the flower of *Orobus*, and temper it with honie, ſalt and vineger, and applie it hot. Horſ-dung boiled in ſharp vineger, or brimſtone beaten to powder, and tempered with ones ſpittle, is good. Alſo black pitch melted with ſom ſalt, and a little *Euphorbium* mixed therewith, and ſo applied, is good. Som write, that the hairs of the dog, whoſe bite cauſſed the madneſs, applied by themſelvs, by their ſympathie or ſimilitude of ſubſtance draw the venom from within outwards; for ſo a Scorpion beaten and applied to the place whereas it ſtung, by drawing out the poiſon that it ſent in, reſtore's the patient to health, both theſe by often experience are affirmed to have certain event. Others chaw unground wheat, and lay it upon the wound, others roſte beans under hot embers, then husk them, and cleav them, and ſo applie them. Alſo the wound may bee wholſomly waſhed and fomented with a decoction of Docks, and then the herb beaten may bee applied thereto; alſo the patient may drink the decoction; and by this one remedie *Aetius* affirm's that hee hath recovered divers; for thus it move's urine plentifully, which is thought much to conduce to the cure of this diſeaſ. There bee ſom who applie the leavs of betonie and nettles beaten with common ſalt; others make a medicine to the ſame purpoſe and after the ſame manner of an Onion, the leavs of rue and ſalt. Yet the reſt are exceeded by treacle diſſolved in *aqua vitæ* or ſtrong wine, and rubbed hard upon the part, ſo that the blood may follow, laying upon the wound when you have wiped it, cloths dipped in the ſame medicine, then preſently applie garlick or onions beaten with common ſalt and turpentine: by this onely remedie I free'd one of the daughters of *Madamoiſelle de Gron* from the ſymptoms of madneſs, & healed the wound, when as a mad dog had bit her grievouſly in the calf of the right leg. Alſo it is good preſently to eat garlick with bread, and then to drink after it a draught of good wine, for garlick by its ſpirituous heat will defend the noble parts from poiſon. There bee ſom who wiſh to eat the roſted liver of the dog that hurt them, or elſ the liver of a goat, of which remedies as yet I have had no experience. Others preſcribe a dram of the ſeeds of *Agnus caſtus* to bee drunk with wine and butter. Others the powder of river-crabs, burnt and drunk in wine. Or, ℞. *rad. gent.* ʒii. *aſtacorum fluviat. in fumo combuſt. & in pollinem redact.* ʒiii. *terræ ſigil.* ʒß. *miſce.* Give ʒi. of this

The force of Sorrel.

The force of Docks.

An hiſtorie.

this ſame powder in the decoction of river-crabs, and let them drink thereof oft at ſundrie times. Manie have caſt themſelvs into the ſea, neither have they thence had anie help againſt madneſs, as *Ferrand Pozet* the Cardinal teſtifieth in his book of poiſons; wherefore you muſt not relie upon upon that remedie, but rather you muſt have recourſ to ſuch things as are ſet in the books of Phyſicians, and approved by certain and manifold experience. But ſeeing that no poiſon can kill, unleſs it bee taken or admitted into the bodie, wee muſt not fear anie harm by ſprinkling our bodies with the *ſanies* of a mad dog, viper, toad, or anie other ſuch like venemous creature, if ſo bee that it bee preſently wiped or waſhed clean away.

Leaping into the ſea no certain remedie againſt madneſs.

CHAP. XV.

What cure muſt bee uſed to ſuch as fear the water, but yet are able to know themſelvs in a glaſs.

SUch as have not their animal facultie as yet o'recom by the malignitie of the rageing venom, muſt have ſtrong purgations given them. Wherefore, if in anie caſe Antimonie bee uſeful, then is it in this, as that which cauſeth ſweats, looſeth the bellie, and procure's vomiting. For it is a part of extreme and dangerous madneſs to hope to overcom the cruel malignitie of this poiſon alreadie admitted into the bowels, by gentle purgeing medicines. Aſſuredly, ſuch and ſo great danger is never overcom without danger. Bathes alſo conduce, which may diſperſ and draw forth the poiſon by cauſſing ſweats. Alſo manie and frequent treacle-potions are good to retund the venom, and ſtrengthen the bowels; alſo it will bee fitting to give them water and all other liquid things, which they ſo much abhor, in a cup with a cover. Alwaies let ſuch as are poiſoned, or bitten, or ſtung by a mad dog or other venemous beaſt, keep themſelvs in ſom warm and light place, that the poiſon which by coldneſs is forced in, may bee the readilyer drawn out by the means of heat, and the ſpirits bee recreäted by the brightneſs of the air, and therefore moov from the center to the circumference of the bodie, and let the room bee perfumed with ſweet things. To eat verie hot and ſalt things preſently at the beginning, as onions, leeks, all ſpiced meats, and ſtrong wine not allaied, ſeem' not to bee beſides reaſon; becauſ ſuch things by their ſpirituous heat hinder the diffuſion of the poiſon over the bodie, and ſtrengthen the filled entrails. There bee ſom alſo that would have them to feed upon groſs and viſcous meats, which by obſtructing the veſſels, may hinder the paſſage of the poiſon to the heart and other parts; and by the ſame reaſon it will bee better to fill themſelvs wth meat to ſatieti: then otherwiſe; becauſ the malignitie of humors is encreaſed by hunger, then which nothing can bee more harmful to venemous wounds. Yet within a ſhort while after, as within five or ſix daies, they muſt return to a mediocritie, and uſe all things temperate, boiled meats rather then roſted, and that in a decoction of opening things, ſo to moov urine. Laſtly, they muſt keep ſuch a diet as melancholick perſons ought to do; neither ſhall they let blood, leſt ſo the poiſon ſhould bee further drawn into the veins; but it is good that the patient's bodie bee ſoluble from the verie firſt. Let their drink bee wine indifferently allaied with water, *oxymel ſimplex*, or the ſyrup of the juice of Citron with boiled water; or elſ this following Julip. R. *ſucci limonum, & malorum citri, an* ℥ß. *ſuc. gran. acid.* ℥ii. *aquæ acetoſæ, min. & roſ. an.* ℥i. *aq. font. coct. quantum ſufficit, fiat Julep, ut artis eſt.* Sleep is to bee avoided until the force of the poiſon is abated; for by ſleep the humors flow back into the bowels. All things that reſiſt poiſon muſt bee given anie waie whatſoever, as lemons, oranges, *angelica*-roots, gentian, tormentil, burnet, vervin, *carduus benedictus*, borage, bugloſs, and the like. Let all things that are afterwards ſet before the patient bee meats of good juice, ſuch as are veal, kid, mutton, partridg, pullets, capons, and the like.

The force of Antimonie againſt madneſs.

Why ſleep is hurtful to ſuch as are bitten by a mad dog, and all ſuch as are poiſoned.

CHAP. XVI.

Of the biteing of a Viper or Adder, and the ſymptoms and cure thereof.

THe remedies that were formerly mentioned againſt the biteings of mad dogs, the ſame may bee uſed againſt all venemous bites and ſting, yet nevertheleſs each poiſon hath his pecular antidote. Vipers or Adders (as wee vulgarly term them) have in their gums, or the ſpaces between their teeth, little bladders filled with a virulent *ſanies*, which is preſſed out into the part that they bite with their teeth. There forthwith ariſeth a pricking pain, the part at the firſt is much ſwollen, and then the whole bodie, unleſs it bee hindred: groſs and bloodie filth ſweat's out of the wound, little bliſters riſe round about it, as if it were burn't, the wound gnaw's, and as it were feed's upon the fleſh, great inflammation poſſeſſeth the liver and the gums, and the whole bodie becom's verie drie, becomming of a pale or yelloweiſh color, with thirſt unquenchable; the bellie is griped by fits, a cholerick vomiting moleſteth them, the ſtomach is troubled with a hicketting, the patients are taken with often ſwoundings, with cold ſweat, the fore-runner of death, unleſs you provide by fit medicines for the noble parts, before the

The bites of vipers how virulent.

The ſymptoms

the poiſon ſhall invade them. *Matthiolus* tell's that hee ſaw a countrie-man, who, as hee was mowing a meadow, by chance cut an Adder in two with his ſithe, which when hee thought it was dead, hee took the one half whereon the head remained, without anie fear in his hand, but the enraged creature, turning about her head, cruelly bit him by one of his fingers, which finger, as men uſually do (eſpecially when as they think of no ſuch thing) hee put into his mouth, and ſucked out the blood and poiſon, and preſently fell down dead.

An hiſtorie.

An hiſtorie.

When as *Charls* the ninth was at *Montpelier*, I went into the ſhop of one *Farges* an Apothecarie, who then made a ſolemn diſpenſation of Treacle, where not ſatisfying my ſelf with the looking upon the vipers which were there in a glaſs, readie for the compoſition, I thought to take one of them in my hands, but whil'ſt that I too curiouſly and ſecurely handled her teeth which were in her upper jaw, covered with a skin, as it were a caſe to keep the poiſon in, the beaſt catched hold of the verie end of my fore-finger, and bit mee in the ſpace which is between the nail and the fleſh; whence preſently there aroſe great pain, both by reaſon of the part endued with moſt exquiſite ſenſe, as alſo by the malignitie of the poiſon: forthwith I exceeding ſtraitly bound my finger above the wound, that ſo I might preſs forth the blood and poiſon, leſt they ſhould diffuſe themſelvs further over the bodie. I diſſolved old treacle in *aqua vitæ*, wherein I dipped and moiſtned cotton, and ſo put it to the wound, and within a few daies I throwly recovered by this onely medicine. You may uſe in ſtead of Treacle, Methridate and ſundrie other things, which by reaſon of their heat are powerful drawers, as a quill roſted in hot embers, garlick and leeks beaten and applied, barlie flowr tempered with vineger, honie, and goats-dung, and ſo applied like a pultis. Som think it ſufficient forthwith to waſh and foment the wound with vineger, ſalt, and a little honie. *Galen* write's that the poiſon inflicted by the bite of a viper, may bee drawn forth by applying to the wound the head of a viper, but otherſom applie the whole viper beaten to maſh.

Remedies for the bite of a viper.

Lib. de theriac.

CHAP. XVII.

Of the Serpent called Hæmorrhous.

The *Hæmorrhous* why ſo called.

THe Serpent *Hæmorrhous* is ſo called, becauſ by biteing hee cauſeth blood to drop out of all the paſſages of the wounded bodie; hee is of a ſmall bodie, of the bigneſs of a viper, with eies burning with a certain fierie brightneſs, and a moſt beautiful skin. The back of him (as *Avicen* write's) is ſpotted with manie black ſpots, his neck little, and his tail verie ſmall: the part which hee bite's forthwith grow's blackiſh, by reaſon of the extinction of of the native heat, which is extinguiſhed by ſuch poiſon whith is contrarie thereto in its whole ſubſtance. Then follow's a pain of the ſtomach and heart, theſe parts beeing touched with the peſtiferous qualitie of the poiſon. Theſe pains are ſeconded by vomiting, the orifice of the ventricle beeing relaxed by a *Diarrhæa*, the retentive facultie of all the parts of the bellie beeing weakned, and the veins which are ſpred through the guts, not beeing able to retain the blood contained in them. For the blood is ſeen to flow out, as in ſtreams, from the noſe, mouth, ears, fundament, privities, corners of the eies, roots of the nail, and gums, which putrefie, the teeth falling out of them. Moreover there happen's a difficultie of breathing, and ſtoppage of the urine, with a deadlie convulſion.

Wonderfull bleedings.

The cure is forthwith to ſcarifie, and burn the bitten part, or elſ to cut it quite off, if that it may bee don without danger of life, and then to uſe powerfullie drawing Antidotes.

CHAP. XVIII.

Of the Serpent called Seps.

The reaſon of the name, and deſcription of the *Seps*.

THe Serpent *Seps* is ſo called, becauſ it cauſeth the part which it bite's, forthwith to putrefie, by reaſon of the cruel malignitie of its poiſon. It is not much unlike the *Hæmorrhous*, but that it curl's or twine's up the tail in divers circles. *Pauſanias* write's that this ſerpent is of an aſh-colour, a broad head, ſmall neck, big bellie, writhen tail, and as hee goe's, hee run's aſide like a crab. But his skin is variegated and ſpotted with ſeveral colors, like to Tapiſtrie. By the crueltie of his cauſtick and

and putrefying venom, hee burn's the part which hee hath bit, with moſt bitter pain; hee cauſeth the ſhedding of the hairs, and as *Aetius* addeth, the wound at the firſt caſteth forth manifeſt blood, but within a little while after, ſtinking filth. The putrefied affected parts wax white, and the bodie all over becom's of the color of that ſcurf, which is termed *Alphos*, ſo that by the wickedneſs of this putrefactive poiſon, not onely the ſpirits are reſolved, but alſo the whole bodie conſumed, as by fire, a peſtilent carbuncle, and other putrid tumors, ariſeing from a hot and humid or ſuffocateing conſtitution of the air. Now for the remedies, they muſt bee ſuch as are formerly preſcribed againſt the biteings of a viper. The ſymptoms.

The figure of the Serpent Seps.

CHAP. XIX.

Of the Baſilisk or Cockatrice.

THe Baſilisk far exceed's all kindes of Serpents in the curſtneſs of its poiſon. Therefore it is affirmed by *Nicander*, that into what place ſoever hee com's, other venemous creatures do forthwith flie thence, for that none of them can ſo much as endure his hiſſing; for hee is thought to kill all things even with this, and not with his biteing and touch onely; beſides, if anie of them haſten to get anie meat or drink, and perceiv that the Baſilisk is not far from from thence, he flie's back, and neglect's the getting of nouriſhment neceſſarie for life. *Galen* write's, that the Baſilisk is a yellowiſh ſerpent, with a ſharp head, and three riſeings diſtinguiſhed with white ſpots, and riſeing up in form of a crown, by reaſon whereof hee is ſtiled the King of Serpents. Certainly the violence of his poiſon in killing men is ſo great, that hee is therefore thought to kill men, and other creatures by his ſight onely. *Solinus* affirm's, that the bodie of a dead Baſilisk hath wondrous faculties. Wherefore the inhabitants of *Pergamum*, in antient times, gave a mightie price for one, to hang upon the joiſts of the temple of *Apollo*, ſo to drive away the Spiders and Birds, leſt they ſhould there weav their webs, or the other build their neſts in that ſacred place. Verily no ravenous creature will touch their carkaſs; but if conſtrained by hunger they do touch it, then they forthwith fall down dead in the ſame place: and this happen's not onely by eating their bodie, but alſo by devouring of the bodies of ſuch beaſts as are killed by their biteings. They kill the trees and ſhrubs by which they paſs, not onely by their touch, but even with their breath. Among the weſtern Æthiopians is the fountain *Nigris*, near which there is a ſerpent called *Catablepas*, ſmall in bodie, and ſlow, haveing a great head; wch it ſcarce can carrie, but that it lie's alwaies upon the ground, otherwiſe it would kill abundance of people, for it forthwith kil's all that ſee's the eies thereof, the Baſilisk hath the ſame force; hee is bred in the province of *Cyrene*, of the length of ſom twelv fingers, with a white ſpot in his head, reſembling a crown; hee chaſeth away all ſerpents with his hiſs: Weaſels are the deſtruction of ſuch monſters: thus it pleaſed nature, that nothing ſhould bee without its equal; they aſſail them in their dens, beeing eaſily known by the barrenneſs or conſumption of the ſoil. Theſe kill them alſo by their ſent, and they die, and the fight of nature is ended: thus nature to the magnanimous Lion, leſt there ſhould bee nothing which hee might fear, hath oppoſed the weak creature the Cock, by whoſe crowing onely hee is terrified and put to flight. *Eraſiſtratus* write's, that a golden yellowneſs affect's the bitten part of ſuch as are hurt by a Baſilisk, but a blackneſs and tumor poſſeſſeth the reſt of the bodie, all the fleſh of the muſcles within a while after falling away peece-meal. An antidote againſt this muſt bee made of a dram of *Caſtoreum*, diſſolved in wine and drunken, or in the juice of poppie. But *Aetius* think's it ſuperfluous to write remedies againſt the Baſilisk, when as the ſight and hearing onely kill's ſuch as either ſee or hear her.

The efficacie of the poiſon of the Baſilisk.

Lib. de theriac.

Why the Baſilisk is thought to kill by his onely ſight.

Plin. lib. 8. cap. 21.

The *Catablepas*.

Nothing in nature without its equal.

Symptoms.

Cure.

The

The figure of a Baſilisk.

CHAP. XX.

Of the Salamander.

The malignitie of a Salamander.

THe Salamander kill's not onely ſuch as it bite's, by makeing a venemous impreſſion, but it alſo infect's the fruits and herbs over which it creep's, with a ſpittle or groſs moiſture which ſweat's out of all the bodie, to the great danger of the health and life of ſuch as eat theſe things at unawares: wherefore it need not ſeem ſtrange, which is received by ſom late writers, that ſom families have all died by drinking water out of the pits, whereinto a Salamander by accident was fallen. For if it ſhall creep upon a tree, it infect's all the fruit with the qualities of cold and moiſt poiſon, wherein it yield's not to Aconite.

The temper of her.

Aetius write's, that ſuch as are infected with the poiſon of a Salamander, certain parts of their bodie grow livid, ſo that they fall away often, beeing putrefied. At the firſt there appear white ſpots over the bodie, then red, afterwards black with putrefaction, and the falling away of the hairs. The cure is, to procure vomit, to looſ the bellie with a glyſter, and to give them Treacle and Mithridate in potions. *Avicen* preſcribe's the ſame things againſt this kinde of poiſon as againſt *opium*, by reaſon of the cold nature of them both; the proper antidote is turpentine, *ſtyrax*, nettle-ſeeds, and cypreſs-leavs. *Dioſcorides* write's, that the Salamander is a kinde of Lizard, dull, variegated, and which is falſly reputed not to bee burnt by fire. But *Plinie* ſaith ſhee is ſo cold, that ſhee extinguiſheth the fire by her touch onely, beeing laied upon hot coals. On the contrarie, *Matthiolus* ſaith, that caſt into a great flame, they are quickly conſumed. It is eaſie out of *Aetius* to reconcile theſe diſagreeing opinions. This creature, ſaith hee, paſſeth through a burning flame, and is not hurt, the flame divideing it ſelf, and giveing her way, but if ſhee continue anie time in the fire, the cold humor beeing conſumed in her, ſhee is burnt. Now the Salamander is black, variegated, with yellow ſpots, ſtar-faſhion.

Symptoms.

The cure.

Lib. 2. cap. 54.

How a Salamander may bee ſaid to live in the fire.

The figure of a Salamander.

CHAP. XXI.

Of the Torpedo.

THe *Torpedo* hath his name from the effect, by reaſon that by his touch and power the members becom torpid and numb; in muddie ſhoars it live's upon fiſh, which ſhee catcheth by craft. For lying in the mud, ſhee ſo ſtupefie's thoſe that are nigh her, that ſhee eaſily prey's upon them; ſhee hath the ſame power over men, for ſhee ſend's a numneſs not onely into the arm of the fiſher-man, but alſo over all his bodie, although his fiſhers pole bee between them.

The craft of the *Torpedo*.

His ſtupefying force.

The

The effigies of a Torpedo.

CHAP. XXII.

Of the Biteings of Asps.

THe wound which is made by an Asp is verie small, as if a needle were thrust into the part, and without anie swelling. These symptoms follow upon her bite, sudden darkness cloud's their eies, much agitation in all their bodies, but gentle notwithstanding; a moderate pain of the stomach trouble's them, their fore-heads are continually troubled with convulsive twitchings, their cheeks tremble, and their eie-lids fall gently to rest and sleep; the blood which flow's from the wound is little, but black; death no longer deferred then the third part of a daie, will take them away by convulsions, unless you make resistence with fitting remedies. The male-Asp make's two wounds, the female four, as it also happen's in the biteings of vipers. Now for that that the poison of Asps congeal's the blood in the veins and arteries, therefore you must use against it such things as are hot and subtil of parts, as mithridate or treacle dissolved in *aqua vitæ*, and the same powred into the wound; the patient must bee warmed by baths, frictions, walking, and the like. When as the hurt part becommeth purple, black or green, it is a sign that the native heat is extinct and suffocated by the malignitie of the venom. Therefore then it is best to amputate the member, if the partie bee able to endure it, and there bee nothing which may hinder. *Vigo* write's, that hee saw a Mountebank at Florence, who, that hee might sell the more of his Antidotes, and at the better rate, let an Asp to bite him by the finger, but hee died thereof som four hours after. To the same purpose you may read *Matthiolus*, whereas hee write's that those Impostors or Mountebanks to cozen the better, and deceiv the people, use to hunt and take vipers and asps long after the spring, that is, then when as they have cast forth their most deadlie poison; then they feed them with meats formerly unusual to them, so that by long keeping and care, at the length they bring it to pass, that they put off a great of their venemous nature; neither beeing thus satisfied, they make them oftentimes to bite upon peeces of flesh, that so they may cast forth into them the venom which is contained in the membrane between their teeth and gums. Lastly, they force them to bite, lick and swallow down an astringent medicine, which they compose and carrie about for the same purpose, that so they may obstruct the passages by wch the venom used to flow out, for thus as length their bites will bee harmless, or without great danger. This therefore is their art, that so they may sell their counterfeit treacle to the people at a high rate, as that which is a most safe remedie against all poisonous bites. *Christopher Andrew* in his book called *Oicoiatria*, write's that the Ilands of Spain are everie where full and stor'd with serpents, asps, and all sorts of venemous beasts, against whose bites they never observed or found anie benefit in treacle. But the efficacie of the following Antidote is so certain and excellent, and approoved by so manifold experience, that in the confidence thereof, they will not bee affraid to let themselvs bee bitten by an Asp. Now this medicine is compoted of the leavs of Mullet, Avenes and red-stock-gilliflowrs in like quantitie, which they boil in sharp vineger and the urine of a sound man, and therewith foment the wounded part. Yet if hee have not taken nor used anie thing of a good while after the wound, it will bee better and more certain, if the patient drink three ounces of this decoction fasting two hours before meat.

Symptoms.

Cureing.

An historie.

By what means Asps may bee made less hurtful. *Gal. lib. de Ther. ad pisonem.*

Against the bites of what serpents treacle doth no good.

A certain remedie against the biteing of Asps.

CHAP. XXIII.

Of the biteing of a Snake.

An historie.

I Have thought good in a true historie to deliver the virulent malignitie of the bite of a Snake, & the remedies thereof. When as King *Charls* the ninth was at Moulins, *Monsieur Le Feure*,

Feure the King's Phyſician, & I were called to cure the Cook of the Ladie of Caſtelpers. Who gathering hops in a hedg to make a ſallet, was bit on the hand by a ſnake that there lay hid, hee putting his hand to his mouth, ſucked the wound to eaſ the pain by ſucking forth the venom. But his tongue forthwith ſwelled ſo big, that hee could not ſpeak his minde: beſides, his whole arm, even to his ſhoulder, was in like ſort much ſwelled, his pain was ſo vehement, that it made him ſwoun twice in my preſence, his face was wan and livid like to a dead bodie; and though I deſpaired of his recoverie, yet not ſuffering him to bee quite forſaken, I waſhed his mouth with treacle diſſolved in white wine, and gave him ſom thereof to drink, adding thereto ſom *aqua vitæ*. I opened his ſwoln arm with manie and deep ſcarifications, eſpecially in the place where hee was hurt, I ſuffered the blood which was wholly ſerous and ſanious,, to flow more plentifully, I waſhed the wounds with treacle and mithridate diſſolved in *aqua vitæ*, and then I put him exceeding warm in bed, procureing ſweat, and makeing him to lie awake, leſt ſleep ſhould draw the poiſon inwards to the entrails. I by theſe means ſo far prevailed, that on the day after hee was free'd from all his malign ſymptoms. Therefore I judged, it onely remained for a perfect cure, that the wound ſhould bee long kept open and waſhed with treacle; neither was I deceived, for within a few daies hee was perfectly recovered.

The cure.

CHAP. XXIV.

Of the bitings of Toads.

The bites of Toads how harmful.

THough Toads want teeth, yet with their hard and rough gums they ſo ſtraitly preſs or pinch the part which they ſhall take hold on, that they will force their poiſon thereinto, and ſo over the whole bodie by the pores of the preſſed part. Moreover they caſt forth their venom by urine, ſpittle and vomit upon herbs, but chiefly upon Strawberries, the which they are reported greatly to affect. Hence manie ſuddenly and ignorantly catch their deaths.

An hiſtorie.

I heard from a man of verie good credit, that there were two merchants not far from the Citie *Tholous*, who whileſt dinner was providing, walked into the Garden that belonged to the Inn, where they gathered ſom ſage leavs, and unwaſhed as they were put them into their wine. They had not as yet dined, when beeing taken with a ſudden *Vertigo*, the whole Inn ſeemed to run round, then loſing their ſight, they fell into a ſwound, intermixed now and then with convulſions. But they ſtammered with their lips and tongues becomming black; a froward and horrid look, with continual vomiting, and a cold ſweat, the fore-runner of death, which preſently ſeazed upon them, their bodies becomming exceedingly much ſwoln. But the Juſtices of the place ſuſpecting that they were poiſoned, made the Inn-keeper and the Gueſts to bee apprehended, beeing examined they all conſtantly and with one voice anſwered, That the dead parties ate of the ſame meat and drink which the reſt did, but onely that they put ſage into their wine. A Phyſician was asked the queſtion whether ſage might bee poiſoned; hee anſwered, it might: but to com to the purpoſe, it muſt appear whether anie venemous creature hath poiſoned the plant with her ſpittle or venemous *ſanies*. This which was lightly pronounced, and onely by conjecture, was by the eie found to bee true. For at the root thereof there was found a hole in the ground full of Toads, who got out by putting in of warm water, made it credible that the plant was poiſoned by their ſpittle and urine, whereby you may underſtand how unwiſely they do, who devour herbs and fruits newly gathered without waſhing. Alſo wee muſt take heed leſt falling aſleep in the fields, wee lie not near the holes which toads or other venemous beaſts of the ſame nature have made their habitation. For thence a venemous or deadlie air may bee drawn into the lungs. For the ſame cauſ wee muſt abſtain from eating of frogs in the month of May, becauſ then they engender with toads. Oxen in feeding ſomtimes lick up ſmall toads together with the graſs, which preſently will breed their great harm, for thereupon the oxen ſwell ſo big, that they often burſt withall. Neither is the venom of toads deadly onely beeing taken inwardly, but even ſprinkled upon the skin, unleſs they forthwith wipe the place, and waſh it with urine, water and ſalt. Such as are poiſoned by a toad turn yellow, ſwell over all their bodies, are taken with an Aſthmatick difficultie of breathing, a *Vertigo*, convulſion, ſwounding, and laſtly by death it ſelf. Theſe ſo horrid ſymptoms are judged inherent in the poiſon of toads, not onely by reaſon of the elementarie qualities thereof, coldneſs and moiſture, which are chiefly predominant therein; but much rather by the occult propertie which is apt to putrefie the humors of that bodie whereto it ſhall happen. Therefore it will bee convenient to procure vomit, eſpecially if the poiſon bee taken by the mouth, to give gliſters, and to weaken the ſtrength of the poiſon by hot and attenuateing Antidotes, as treacle and methridate diſſolved in good wine; but in concluſion to digeſt it by bathes, ſtoves, and much and great exerciſe. *Rondeletius* in his book *de piſcibus*, affirm's the ſame things of the curſed venom of toads, as wee have formerly delivered: yet that they ſeldom bite, but that they caſt forth either their urine, the which they gather in a great quantitie in a large bladder, or

The ſymptoms occaſioned by the poiſon of Toads.

May-frogs.

The cure.

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elſ their venemous ſpittle or breath againſt ſuch as they meet withall, or aſſail; beſides, the herbs which are tainted by their poiſonous breath, but much more ſuch as are ſprinkled with their ſpittle or urine, are ſufficient to kill ſuch as eat them. The Antidotes are juice of betonie, plantane, mug-wurt, as alſo the blood of Tortoiſes made with flower into pills, and forthwith diſſolved in wine, and drunken. *Plinie* write's, that the hearts and ſpleens of Toads reſiſt poiſon. The vulgar opinion is falſ, who think that the Toad-ſtone is found in their heads, which is good againſt poiſon.

Antidotes againſt the poiſon of Toads.

CHAP. XXV.

Of the ſtinging of a Scorpion.

A Scorpion is a ſmall creature with a round bodie in form of an egg, with manie feet, and a long tail conſiſting of manie joints, the laſt whereof is thicker, and a little longer then the reſt, at the verie end thereof is a ſting, in ſom two, hollow and replete with cold poiſon, the which by the ſting it caſt's into the obvious bodie; it hath five legs on each ſide forked with ſtrong claws, not unlike to a Crab or Lobſter, but the two foremoſt are bigger then the reſt; they are of a blackiſh or ſootie color, they go aſide, aſide; and oftimes faſten themſelvs with their mouths and feet ſo faſt to men, that they can ſcarce bee plucked there-hence. There bee ſom who have wings like the wings of Locuſts, waſteing the corn, and all green things with their biteing and burning. Such are unknown in France. Theſe flie divers countries, like winged Ants. This is likely to bee true by that which *Matthiolus* write's, that the husband-men in Caſtile in Spain, in digging the earth oftimes finde a ſwarm of Scorpions, which betake themſelvs thither againſt winter. *Plinie* write's, that Scorpions laid waſte a certain part of Æthiopia, by chaſeing away the inhabitants. The Antients made divers kindes of Scorpions, according to their varietie or difference of colors, ſom beeing yellow, others brown, reddiſh, aſh-colored, green, whitiſh, black, duskie; ſom have wings, and ſom are without. They are more or leſs deadlie, according to the countries they inhabit. In Tuſcanie and Scithia they are abſolutely deadlie, but at Trent, and in the Iland Pharos their ſtinging is harmleſs. The place ſtung by a Scorpion preſently begin's to bee inflamed, it waxeth red, grow's hard, and ſwell's, and the patient is again pained, hee is one while hot, another while cold, labor preſently wearie's him, and his pain is ſom-whiles more, and ſom-whiles leſs, hee ſweat's and ſhake's as if hee had an Ague, his hair ſtand's upright, paleneſs diſ-color's his members, and hee feel's a pain, as if hee were pricked with needles over all his skin, winde flieth out backwards, hee ſtrive's to vomit and go to ſtool, but doth nothing; hee is moleſted with a continual fever and ſwounding, which at length proov's deadlie, unleſs it bee remedied. *Dioſcorides* write's, that a Scorpion beaten and laid to the place where hee is ſtung, is a remedie thereto; as alſo eaten roſted to the ſame purpoſe. It is an uſuall, but certain remedie to annoint the ſtung place with the oil of Scorpions. There bee ſom who drop into the wound the milkie juice of figs; others applie calamint beaten, other-ſom uſe barlie-meal mixed with a decoction of *Rue*. Snails beaten together with their ſhells, and laid thereon, preſently aſſwage pain. *Sulphur vivum* mixed with Turpentine, and applied plaſter-wiſe, is good; as alſo the leavs of *Rue* beaten, and laid thereto. In like ſort alſo the herb *Scorpioides*, which thence took its name, is convenient, as alſo a bryonie-root boiled and mixed with a litile ſulphur and old oil. *Dioſcorides* affirm's, Agarick in powder, or taken in wine to bee an Antidote againſt poiſons, verily it is exceeding good againſt the ſtingings or biteings of ſerpents. Yet the continual uſe of a bath ſtand's in ſtead of all theſe, as alſo ſweat, and drinking wine ſomwhat allai'd. Now Scorpions may bee chaſed away by a fumigation of *Sulphur* and *Galbanum*; alſo oil of Scorpions dropped into their holes, hinder's their comming forth. Juice of raddiſh doth the ſame. For they will never touch one that is beſmeared with the juice of radiſh or garlick, yea verily, they will not dare to com near him.

The deſcription of a Scorpion.

His tail.

Winged Scorpions.

Symptoms.

Lib.3.cap.10. & lib.6.ca.44.

Lib.3.cap.1.

Scorpions chaſed away with the juice of Garlick or Radiſh.

CHAP. XXVI.

Of the ſtinging of Bees, Waſps, &c.

Bees, Waſps, Hornets and ſuch like, cauſ great pain in the skin wounded by their ſtinging, by reaſon of the curſineſs of the venom which they ſend into the bodie by the wound, yet are they ſeldom deadlie, but yet if they ſet upon a man by multitudes, they may com to kill him. For thus they have ſomtimes been the death of horſes. Wherefore becauſ ſuch as are ſtung by theſe, by reaſon of the crueltie of pain, may think they are wounded by a more virulent and deadlie creature, I think it not amiſs to ſet down what ſignes follow upon their ſtingings. Great pain preſently ariſeth, which continueth untill the ſting left in the part is taken forth, the part becom's red and ſwoln, and there riſeth a puſh or little bliſter. The cure is, forthwith to ſuck the wound verie

Symptoms.

The cure.

verie hard, and thereby to draw forth the ſtings, which if they cannot thus bee gotten out, the place, if nothing hinder, is to bee cut, or elſ temper aſhes with leven or oil, and ſo applie them: the part alſo may bee verie conveniently put into hot water, and there fomented for an houres ſpace, and at length waſhed in ſea-water. Creſſes beaten and applied, aſſwage the pain and diſcuſs the humor cauſling the tumor. Ox-dung macerated in oil and vineger, and applied hot, doth the ſame. There are ſom who applie to the part the ſame creatures beaten, as wee formerly ſaid of Scorpions; beans chawed and laid to the part aſſwage pain. Vineger, honie and ſalt applied exceeding hot, are good, if beſides, you dip a cloth therein, and lay it upon the place; *ſulphur vivum* tempered with ſpittle hath the ſame effect. The milkie juice of unripe figs incorporated with honie, is judged verie effectual, but it is much the better, mixed with treacle. Waſps will not ſting nor bite ſuch as annoint their bodies with the juice of mallows mixed with oil. They may bee quickly chaſed away with the fume of brimſtone and ſuch like things. A waſp is ſaid, if ſhee finde a viper dead, to dip her ſting in the others poiſon, and thence men learned to empoiſon the heads of their arrows. The rough and hairie worms, which are commonly called Bear-worms, eſpecially thoſe which breed about a Pine-tree, cauſ great itching, redneſs and ſwelling in the part which they bite, touch or grate upon verie hard. A remedie hereof is onions beaten with vineger, and the reſt of the things formerly mentioned.

The bites of Bear-worms.

CHAP. XXVII.

Of the bite of a Spider.

Differences of Spiders.

SPiders weav webs with various art, yet in theſe they alwaies make a lurking-hole, ſo to lie in wait to catch the intrapped flies, and ſo to prey upon them. There are manie ſorts of Spiders; one is termed *Rhagium*, round, and like a black-berrie, whence it taketh the name; it hath a verie ſmall mouth under the mid'ſt of the bellie, and moſt ſhort feet, as if they were imperfect, her bite is as painful as the ſting of a Scorpion. Another is called *Lupus*, or the Wolf-Spider, becauſ ſhee doth not onely lie in wait to catch Flies, but alſo Bees and Waſps, and all ſuch things as may flee into her web. The third is named *Myrmecion*, it is larger then an Ant, but headed like one, the bodie thereof is black, and hath white ſpots or ſtreaks running towards the back. The fourth kinde may bee called *Veſparium*, in other things reſembling a Waſp, but that it want's the wings; of a reddiſh color, and liveing onely on herbs. The Antients have thought their biteings to bee venemous. Now their poiſon is therefore thought to bee cold, becauſ the ſymptoms thence ariſeing are winde in the bellie, refrigerations of the extreme parts of the bodie, numneſs in the bitten part, with ſenſ of cold and ſhakeing. The wound muſt forthwith bee waſhed with verie hot vineger; then muſt you lay thereto Onions, and ſuch like things beaten, then procure ſweat by art, as by baths and ſtoves, yet nothing is more effectual then treacle and mithridate.

CHAP. XXVIII.

Of Cantharides *and* Bupreſtes.

The deſcription of *Cantharides*.

Cantharides ſhine as it were with a golden color, acceptable to the eie, by reaſon of the commixture of a blewiſh or greeniſh color therewith, yet their ſmell is ungrateful. They are hot and drie in the fourth degree, and ſo cauſtick, corroſive and venemous, not onely by reaſon of their cauſtick qualitie, but becauſ of a ſecret antipathie which they naturally have againſt the urinarie parts; which effects they produce not onely if they bee taken by the mouth into the bodie, but even applied outwardly to raiſ bliſters. Such as have taken them inwardly, have the taſte of pitch, or ſom thing like *cedria*, or the roſin of Cedars in their mouths; it is likely that this taſte proceed's from the humors diſſolved by the putredinous heat in the ſtomach, guts & liver, and the vapors that there-hence ariſe; for taken inwardly, they gnaw, exulcerate and burn all parts from the mouth even to the bellie, whence enſueth a bloodie-flux, excrements flowing out, which reſemble the waſhings of new-killed fleſh. Then follow's a burning fever, *vertigo*, madneſs, reſtleſneſs, the brain beeing diſturbed by the plentie of vapors lifted up from the corroded and burnt parts and humors, which therefore when as they appear, you may know the affect is uncureable. In the parts appointed for the receiving and conveiance of the urine they cauſ a burning inflammation, excoriation, ſtrong and continual erection of the yard, whence enſue's a bloodie and painful ſtrangurie, in ſtead of which there oftimes happen's or ſucceed's an *Iſchurie*, or ſtoppage of the water, whence a gangrene and mortification of the part, and ſo in concluſion of the whole bodie beſides. When as *Cantharides* are taken inwardly, the remedie is vomiting, drinking of Cows-milk to correct the heat and drineſs, good alſo to mitigate the ulcers, and ſtay the *dyſenterie*; it is good alſo to inject it into the guts by glyſter.

Enemies to the Bladder. Symptoms.

In

In stead thereof sallet-oil, or oil of sweet almond's is convenient to retund the acrimonie of the poison fastned to the sides of the stomach. The rest and whole cure of this poison you may learn by the following historie. A certain whore, the better to enjoy the companie of a young Abbot who loved her, entertained him with a banquet, and sprinkled divers of their cates with the powder of *Cantharides*, to incite him the more to venerie. The next day, when as the Abbot cast forth pure blood at his fundament and yard which stood verie stiffe, hee called som Physicians, who presently by the fore-mentioned symptoms, which were all verie apparent in him, understood that hee had *Cantharides* given him: wherefore they purged him upwards with vomits, and downwards by glysters made with French-barlie, Rice, a decoction of mallowes, seeds of line and fenugreek, oil of lillies, goats-suet: then presently after they gave him a little treacle with a good quantitie of *conserv's* of violets, which might draw the poison outwards, they gave him milk to drink, and caussed him to to use injections into the urinarie passage and guts made of refrigerateing things, as the juice of lettuce, purslaine, cucumbers, gourds, melons; of tough and viscid things, that so they might stick the more easily and longer to the ulcerated parts, as the mucilages of *psilium*, mallows, quince-seeds, syrup of water-lillies, poppies and violets, fresh butter, and oil of sweet almonds, and they made him drink onely barlie-water, or the common ptisan; they let him feed on veal, kid, and pork boiled with lettuce, purslaine, barly and violet leaves, the which by their humiditie might relax the bellie, and by their toughness lenifie the roughness of asperitie; they applied also refrigerateing things to the loines, share and *perinæum* to asswage the heat of the urine. At length they put him into a warm bath, and to conclude, they left nothing unattempted to draw forth or weaken the poison. But all their endeavors were in vain, for the Abbot died, not beeing destitute of remedies conveniently prescribed, but overcom by the contumacious malignitie of the poison. The Physicians pains had far better succes in a certain Gentlewoman against this kinde of affect; her whole face was deformed with red, fierie and filthie pustles, so that all shunned her companie as if shee had been troubled with a Leprosie, and were readie to forbid her the societie of men; shee came to *Paris*, and calling *Hollerius* and *Grealmus* Physicians, mee and *Caballus* beeing Surgeons, shee made a grievous complaint, and besought us earnestly for som remedie against so great a deformitie of her face; having diligently considered her case, wee pronounced her free from a Leprosie; but wee judged it fit to applie to her whole face a vesicatorie of *Cantharides*, three or four houres after the application whereof, the medicines beeing com to work its effect, her bladder began to burn exceedingly, and the neck of her womb to swell, with gripings, continual vomiting, making of water and scowring, a troublesom agitation of the bodie and members, a burning and absolutely fierie fever. I forthwith called the Physicians, it was decree'd that shee should drink wine plentifully, and that it should bee injected by the fundament into the guts, and by the urinarie passage into the bladder and the neck of the womb, and that shee should keep her self, untill the pain were mitigated, in a warm bath made of the decoction of Line-seeds, the roots and leaves of mallowes, marsh-mallowes, violets, henbane, purslain and lettuce; and her loines and genitals should bee anointed with *unguentum rosatum and populeon* stirred and incorporated with *oxycrate*. By these means, all the symptoms were mitigated. Her face in the *interim* rose all in a blister, and much purulent matter came out thereof, and so the deformitie, wherewith shee was formerly troubled, vanished away for ever, so that within a while after shee was married, and had manie children, and is yet living in perfect health.

A historie. The cure. A historie. *Cantharides* applied to the head, ulcerate the bladder. A remedie against Leprous pustles.

Bupresties also are of the kinde of *Cantharides*, beeing like unto them in shape and facultie. If an Ox or sheep or anie other creature shall in feeding devour one of them, hee will presently swell up like a Tun; whence also they take their name: if a man take them inwardly, he shall endure the like symptoms as in takeing *Cantharides*, and over and besides both his stomach and his whole bellie shall bee wonderfully puffed up, as if hee had a Dropsie. It is probable that this inflation like a tympanie happeneth by humors diffused and resolved into vapors by the fierie acrimonie of the venom: They are to bee cured after the same manner as such as have drunk *Cantharides*, Lastly, as in all other poisons which are taken into the bodie, so also here, if the poison taken by the mouth bee thought as yet to bee in the stomach, you must then procure vomit. If it bee gotten into the guts, then must it bee drawn away by glysters; if diffused over all the bodie, then must you make use of such things as may drive the poison forth from the center to the circumference, such as are baths and stoves.

The reason of the name.

CHAP. XXIX.

Of Horse-leeches.

What horse-leeches most virulent.

HOrse-leeches are also venemous, especially such as live in muddie stinking ditches, for these are less hurtful which reside in clear and pure waters. Wherefore, before they are

to bee uſed in caſes of phyſick, they muſt bee kept for ſom daies ſpace in clean water, that ſo they may purge themſelvs; otherwiſe they may chance to leav ulcers hard to cure in the places whereto they ſhall bee applied, and the rather, if they bee violently plucked off, becauſ they by that means leav their teeth faſtned in the part. Now hee which by chance hath ſwallowed a Horſ-leech, muſt bee asked in what part hee feeleth her, that is, the ſenſ of her ſucking. For if ſhee ſtick in the top of the throat or gullet, or in the midd'ſt thereof, the part ſhall bee often waſhed with muſtard diſſolved in vineger. If ſhee bee near the orifice of the ventricle, it is fit that the patient by little and little ſwallow down oil with a little vineger. But if ſhee faſten to the ſtomach, or the bottom of the ventricle, the patient, by the plucking of the part, ſhall perceiv a certain ſenſ of ſucking, the patient will ſpit blood, and will for fear becom melancholick. To force her thence, hee ſhall drink warm water with oil; but if ſhee cannot ſo bee looſed, then ſhall you mix aloës therewith, or ſom thing endued with the like bitterneſs, for ſhee will by that means leav her hold, and ſo bee caſt forth by vomit. You may perceiv this by ſuch as are applied to the skin, on the external parts, for by the aſperſion of bitter things, whether they bee full or emptie, they will forſake their hold. Then ſhall the patient take aſtringent things, which may ſtop the blood flowing forth of the bitten part, ſuch is *Conſerv of Roſes*, with *terra ſigillata*, *Bole-Armenick*, and other more aſtringent things, if need ſo require. For if they ſhall adhere to ſom greater branch of ſom vein or arterie, it will bee more difficult to ſtop the flowing blood.

Divers remedies according to the diverſitie of the parts.

But for that not the earth onely, but the ſea alſo produceth venemous creatures, wee will in like ſort treat of them, as wee have alreadie don of the other, beginning with the Lampron.

CHAP. XXX.

Of the Lampron.

The deſcription of the Lampron.

THe Lampron, called in Latine *Murena*, is a ſea-fiſh ſomthing in ſhape reſembling a Lamprie, but ſhee is bigger and thicker, and hath a larger mouth, with teeth long, ſharp and bending inwards, ſhee is of a duskie color, diſtinguiſhed with whitiſh ſpots, and ſom two cubits length; the Antients had them in great eſteem, becauſ they yield good nouriſhment, and may bee kept long alive, in pools or ponds, and ſo taken as the owners pleaſ to ſerv their table, as it is ſufficiently known by the hiſtorie of the Roman *Craſſus*. Shee by her biteing induceth the ſame ſymptoms as the viper, and it may bee helped by the ſame means. Verily the Lampron hath ſuch familiaritie with ehe Viper, that leaving her natural element the ſea, ſhee leapeth aſhoar, and ſeeketh out the Viper in her den to join with her in copulation, as it is written by *Ælian* and *Nicander*.

The natural friendſhip of the Lampron and Viper.

CHAP. XXXI.

Of the Draco-marinus, *or ſea-Dragon.*

THe ſea-Dragon, called by the French *Viva*, for his vivacitie (and by the Engliſh a *Viver*, or as ſom ſay, a *Qua-viver*) becauſ beeing taken in fiſhing, and drawn out of the ſea, ſhee is ſaid long to ſurvive. Her pricks are poiſonous, but chiefly thoſe that are at the edges of her gils. Which is the reaſon that Cooks cut off their heads before they ſerv them up to the table; and at Roven the fiſher-men lay them not upon their ſtalls to ſell before they have cut off their heads. The wounded part of ſuch as are hurt, pain's them much with inflammation, a fever, ſwounning, gangrene and deadlie mortification, unleſs it bee quickly withſtood. Not verie long ago the wife of *Monſieur Fromaget*, Secretarie of the requeſts, was wounded with a prick of this fiſh in her middle-finger, there followed a ſwelling and redneſs of the part, without much pain; but perceiving the ſwelling to encreaſ, beeing made more warie by the miſchance of her neighbor the wife of *Monſieur Bargelonne*, Lievtenant particular in the Chaſtelet of Paris, who died not long before by the like accident beeing neglected, ſent for mee; I underſtanding the cauſ of her diſeaſ, laid to her pained finger and her whole hand, beſides a pultis made of a great Onion roſted under the coles, leaven, and a little treacle. The next day I wiſhed her to dip her whole hand into warm water, ſo to draw forth the poiſon, then I divided the skin about it with much ſcarification, but onely ſuperficiarily; to the gaſhes I applied Leeches, which by ſucking drawing a ſufficient quantitie of blood, I put thereto treacle diſſolved in *aqua vitæ*. The next day the ſwelling was aſſwaged, and the pain eaſed, and within a few daies ſhee was perfectly well. *Dioſcorides* write's, that this fiſh divided in the mid'ſt, and applied to the wound, will cure it.

Symptoms.

An hiſtorie.

The cure.

CHAP.

CHAP. XXXII.

Of the Paſtinaca marina, *or Sting-Ray, which ſom call the* Fierce-claw.

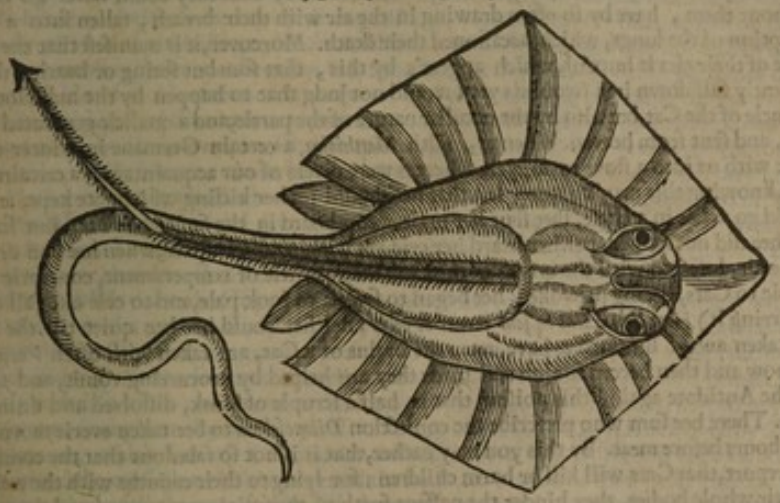
SUch as are ſtung by a Sting-Ray (as *Aetius* hath written) the place of the wound doth manifeſtly appear; there enſue's thereon laſting pain and the numneſs of the whole bodie. And ſeeing that it hath a ſharp and firm ſting, whereby the nervs by the deepneſs of the ſtroke may bee wounded, it ſo happen's that ſom die forthwith, their whole bodies ſuffering convulſions. Moreover, it will kill even the verie trees into whoſe roots it is faſtned. Yet *Plinie* affirm's, that it is good againſt the pain of the teeth, if the gums bee ſcarified therewith, yea, and it beeing made into powder with white Hellebore, or of it ſelf, will cauſ teeth to fall out without anie pain, or anie violence offered to them. This fiſh is good meat, the head and tail excepted; ſom of them have two ſtings, other-ſom but one; theſe ſtings are ſharp like a ſaw with the teeth turned towards their heads. *Oppianus* write's, that their ſtings are more poiſonous then the Perſian's arrows, for the force of the poiſon remaineth, the fiſh beeing dead, which will kill not onely living creatures, but plants alſo. Fiſher-men, when they catch this fiſh, preſently ſpoil him of his ſting, leſt they ſhould bee hurt therewith. But if by chance they bee hurt therewith, then take they forth his liver, and lay it to the wound; furthermore, the fiſh beeing burnt and made into powder, is the true antidote of his wound. The Sting-Ray live's in muddie places near the ſhoar, upon the fiſhes that hee hunteth and cattheth with his ſting, haveing the teeth thereof turned towards his head for the ſame purpoſe. Hee is not unlike a Ray, and I have here given you his figure.

The ſymptoms.

Lib.9.cap.48.

The virulencie of her ſting.

The figure of a Sting-Ray.



CHAP. XXXIII.

Of the Lepus marinus, *or Sea-hare.*

PLinie call's the Sea-hare, a maſs or deformed piece of fleſh. *Galen* ſaith it is like a Snail taken forth of the ſhell. It is exceedingly poiſonous in the judgment of the Antients; wherefore it is not amiſs to ſet down the deſcription of it, leſt wee might eat it at unawares, too earneſtly view it, or ſmell thereto, as alſo that wee may uſe it againſt the poiſon thereof; it is an inhabitant not onely of the ſea, but alſo of lakes of ſea-water, eſpecially ſuch as are muddie; it is of the ſame color as the hair of the land-hare is, it hath a hole in the head, out of which hee putteth a certain piece of fleſh, and pluck's it back again when as hee is ſeen. *Paulus*, *Aetius*, *Plinie*, *Galen* and *Nicander* are of one opinion, and agree in this, that if a woman big with childe do too earneſtly look upon one, ſhee will vomit, and preſently after abort. They which have drunk this poiſon, ſaith *Dioſcorides*, are troubled with pain in the bellie, and their urine is ſtopped. If they do make water, then is it bloodie; they run down with ſtinking ſweat, which ſmell's of fiſh; a cholerick vomiting ſomtimes mixed with blood enſue's thereon.

Aetius write's, that all their bodies turn yellow, their faces ſwell, and their feet, but chiefly their genital member, which is the cauſ they cannot make water freely. *Galen* write's, that it is the propertie of the Sea-hare to exulcerate the lungs. Their antidote is Aſſe's-milk, muskadine, or honied-wine continually drunken, or a decoction of the roots and leavs of mallows.

The deſcription of the Sea-hare.

The earneſt beholding of a Sea-hare will cauſ abortion.

The ſymptoms.

The antidote.

Mallows. It is good for the falling away of the hair. I have here given you the figure thereof out of *Rondeletius* his book of Fiſhes.

The figure of a Sea-Hare.

CHAP. XXXIV.

Of the poiſon of Cats.

A Cat's hair moſt ſubject to choak.

NOt onely the brain of a Cat, beeing eaten, is poiſonous and deadlie to man, but alſo their hair, their breath, yea and their verie preſence to ſom proov deadlie. For although anie hair devoured unawares, may bee enough to choak one, by ſtopping the inſtruments of reſpiration, yet the hairs of a Cat by a certain occult propertie, are judged moſt dangerous in this caſe: beſides alſo, their breath is infected with a certain hurtful malignitie. For *Matthiolus* ſaith, that hee knew ſom, who beeing ſo delighted with Cats, that they could never go to bed without them, have by ſo often drawing in the air with their breath, fallen into a conſumption of the lungs, which occaſioned their death. Moreover, it is manifeſt that the verie ſight of their eies is hurtful, which appear's by this, that ſom but ſeeing or hearing them, preſently fall down in a ſwound; yet I would not judg that to happen by the malicious virulencie of the Cat, but alſo by the peculiar nature of the partie, and a qualitie generated with him, and ſent from heaven. When as, ſaith *Matthiolus*, a certain Germane in winter-time, came with us into a ſtove to ſupper, whereas were divers of our acquaintance, a certain woman, knowing this man's nature, leſt that hee ſhould ſee her kitling which ſhee kept, and ſo ſhould go away in a chafe, ſhee ſhut her up in a cup-board in the ſame chamber. But for all that hee did not ſee her, neither heard her crie, yet within a little ſpace, when hee had drawn in the air, infected with the breath of the Cat, that qualitie of temperament, contrarie, or enemie to Cats, beeing provoked, hee began to ſweat, to look pale, and to crie out (all of us admireing it) *Here lie's a Cat in ſom corner or other*; neither could hee bee quiet till the Cat was taken away. But ſuch as have eaten the brains of a Cat, are taken with often *Vertigo's*, and now and then becom fooliſh and mad: they are helped by procureing vomit, and takeing the Antidote againſt this poiſon, that is, half a ſcruple of Muſk, diſſolved and drunk in wine. There bee ſom who preſcribe the confection *Diamoſchum* to bee taken everie morning, four hours before meat. By this you may gather, that it is not ſo fabulous that the common ſort report, that Cats will kill or harm children; for lying to their mouths with the weight of their whole bodies, they hinder the paſſage forth of the fuliginous vapors, and the motion of the cheſt, and infect and ſtiffe the ſpirits of tender infants, by the peſtiferous air and exhalation which they ſend forth.

The breath of a Cat moſt hurtful to the lungs.

An hiſtorie.

A wonderful antipathie between a man and a Cat.

The Antidote againſt the brains of a Cat.

Cats dangerous for children.

CHAP. XXXV.

Of certain poiſonous Plants.

Apium riſus.

HAveing deſcribed the poiſons that com from living creatures, I com to ſpeak of ſuch as are from Plants, beginning with the Sardonian herb, which is alſo called *Apium riſus*: this is a kinde of *Ranunculus*, or Crow-foot: (and, as it is thought, the round-leaved water Crow-foot, called Marſh-crow-foot, or Spear-wort) it taketh away the underſtanding of ſuch as eat there of, and by a certain diſtention of the nervs, contract's the cheeks, ſo that it make's them look as if they laughed; from this affect came that proverbial ſpeech of the *Sardonian laughter*, taken in evil part. His *Bezoar*, as one may term it, is the juice of Balm.

His Antidote.

Napellus, or Monks-hood.

The juice, fruit, and ſubſtance of *Napellus* taken inwardly, killeth a man the ſame day, or at the furtheſt in three daies: yea, and ſuch as eſcape the deadlie force thereof by the ſpeedie and convenient uſe of Antidotes, fall into an hectick fever, or conſumption, and becom ſubject to the falling-ſickneſs, as *Avicen* affirmeth. And hence it is, that barbarous people poiſon their arrows therewith. For the lips are forthwith inflamed, and the tongue ſo ſwell's, that by reaſon thereof it cannot bee contained in the mouth, but hang's out with great horror; their eies are inflamed, and ſtand forth of their head, and they are troubled with a *Vertigo* and ſwounding,

swounding, they becom so weak that they cannot stir their legs, they are swoln and puffed in their bodies, the violence of the poison is so great. The Antidote thereof is a certain little creature like a * Mouse, which is bred, and live's on the root of *Napellus*, beeing dried and drunk in powder, to the weight of two drams. In want hereof, you may use the seed of Raddish or Turnips to drink, and annoint the bodie also with oil of Scorpions.

* Our Autor is deceived by the *Arabians*, who (it may bee) mistook the greek word μῦια, and in stead thereof reade μυῖα for a Flie, a Mouse; for there is no Mouse to bee found, but whole swarms of Flies, which feed thereon: you may finde the description of an Antidote made with them in *Lobel's Stirp. advers. pag.* 301.

Dorycinum and *Solanum Manicum*, or deadlie Night-shade, are not much different in their mortal symptoms or effects. *Dorycinum* beeing drunk, resembleth milk in taste, it causeth continual hicketting, it troubleth the tongue with the weight of the humor, it causeth blood to bee cast forth of the mouth, and certain mucous matter out of the bellie, like that which commeth away in the bloodie flux. A remedie hereto are all shell-fishes, as well crude as rosted, also Sea-Lobsters and Crabs, and the broth or liquor wherein they are boiled, beeing drunk. Now the root of *Solanum Manicum* drunk in the weight of one dram in wine, causeth vain and not unpleasing imaginations, but double this quantitie causeth a distraction or alienation of the minde for three daies; but four times so much kill's. The remedies are the same as these prescribed against *Dorycinum*.

Dorycinum and *Solanum Manicum*, or deadlie Night-shade.

The symptoms.

Hen-bane drunken, or otherwise taken inwardly by the mouth, causeth an alienation of the minde like drunkennes; this also is accompanied with an agitation of the bodie, and exsolution of the spirits like swounding. But amongst others, this is a notable symptom, that the patients so dote, that they think themselvs to bee whipped: whence their voice becom's so various, that somtimes they bray like an Ass or Mule, neigh like an Horse, as *Avicen* write's. The Antidote is pistick nuts eaten in great plentie, treacle also and mithridate dissolved in sack, also worm-wood, *rue* and milk.

Hen-bane.

The Antidote.

Of Mushroms, som are deadlie and hurtfull of their own kinde and nature, as those, which broken, presently becom of divers colours, and putrefie: (such as *Avicen* saith those are which be found of a grayish or blewish colour) others though not hurtfull in qualitie, yet eaten in greater measure then is fitting, becom deadlie; for seeing by nature they are verie cold and moist, and consequently abound with no small viscositie, as the excrementitious phlegm of the earth or trees whereon they grow, they suffocate and extinguish the heat of the bodie, as overcom by their quantitie, and strangle as if one were hanged, and lastly kill. Verily I cannot chuse, but pittying Gourmondizers, who though they know that Mushroms are the seminarie and gate of death, yet do they with a great deal of doo, most greedily devour them; I say, pittying them, I will shew them, and teach them the art, how they may feed upon this so much desired dish, without the endangering of their health. Know therefore that Mushroms may bee eaten without danger, if that they bee first boiled with wilde pears: but if you have no wilde pears, you may supplie that defect with others which are the most harsh, either newly gathered, or dried in the sun. The leavs, as also the bark of the same tree, are good, especially of the wilde; for pears are their Antidote: yet *Conciliator* give's another, to wit, garlick eaten crude, whereto in like sort vineger may bee fitly added, so to cut and attenuate the tough, viscous and gross humors, heaped up, and in danger to strangle one by the too plentiful eating of Mushroms, as it is delivered by *Galen*.

Mushroms.

Their Antidote.

In 5. epidem.

Ephemerum, which som call *Colchicum* or *Bulbus sylvestris*, that is, medow saffron, beeing taken inwardly, causeth an itching over all the bodie, no otherwise then those that are nettled, or rubbed with the juice of a Squill. Inwardly they feel gnawings, their stomach is troubled with a great heavines, and the disease encreasing, there are streaks of blood mixed with the excrements. The Antidote thereof is womans milk, Asses or Cows-milk drunken warm, and in a large quantitie.

Colchicum, or Medow-Saffron.

The Antidote.

Mandrag taken in great quantitie, either the root or fruit causeth great sleepines, sadnes, resolution and languishing of the bodie, so that after many scritches and gripeings, the patient fall's asleep in the same posture as hee was in, just as if hee was in a Lethargie. Wherefore in times past they gave Mandrag to such as were to bee dismembred. The apples, when as they are ripe, and their seeds taken forth, may bee safely eaten, for beeing green and with their seeds in them, are deadlie. For there ariseth an intolerable heat, which burn's the whole surface of the bodie, the tongue and mouth wax drie, by reason whereof they gape continually, so to take in the cold air; in which case unless they bee presently helped, they die with convulsions. But they may easily bee helped, if they shall presently drink such things as are convenient therefore. Amongst which, in *Conciliator*'s opinion, excell raddish-seeds eaten with salt and bread for the space of three daies. Sneesing shall bee procured, if the former remedie do not quickly refresh them, and a decoction of Coriander or Pennie-royall in fair water shall bee given them to drink warm.

Mandrag.

The cure.

The ungrateful taste of the juice of black poppie, which is termed *Opium*, as also of Mandrag, easily hinder's them from beeing put into meat or drink, but that they may bee discerned, and chiefly for that neither of them can kill, unless they bee taken in a good quantitie. But becaus there is danger, lest they bee given in greater quantitie then is fitting by the ignorance of Physicians, or Apothecaries, you may by these signs finde the error.

Opium.

Why not used in poisonings.

There

The symptoms.

There ensue's heavie sleep, with a vehement itching, so that the patient oftimes is forced thereby to cast off his dull sleep wherein hee lay, yet hee keep's his eie-lids shut, beeing unable to open them. But by this agitation there flow's out sweat, which smel's of *orium*, the bodie waxeth pale, the lips burn, the jaw-bone is relaxed, they breath little and seldom. When as their eies wax livid, unless they bee drawn aside, and that they are depressed from their orb, wee must know that death is at hand. The remedie against this is two drams of the powder of *Castoreum* given in wine.

Hemlock.

The symptoms

Hemlock drunken, causeth *Vertigo's*, troubleth the minde, so that the patients may bee taken for mad men; it darkneth the sight, causeth hicketting, and benum's the extreme parts, and lastly strangle's with convulsions, by suppressing or stopping the breath of the Arterie. Wherefore at the first, as in other poisons, you must endeavor to expell it by vomit; then inject glysters, to expell that which is got into the guts; then use wine without mixture, which is verie powerful in this case. *Peter Apponensis* think's the Bezoar or Antidote thereof to bee a potion of two drams of Treacle, with a decoction of *Dictamnus* or *Gentian* in wine. Hee which further desire's to enform himself of the effects of Hemlock, let him read *Matthiolus* his commentarie upon *Dioscorides*, where as hee treat's of the same subject.

The Antidote.

In lib. 6. dioſc.

Aconitum called of *Aconis* a town of the *Periendines*, where as it plentifully grow's. Accordind to *Matthiolus*, it kill's Wolvs, Foxes, Dogs, Cats, Swine, Panthers, Leopards, and all wilde beasts, mixed with flesh, and so devoured by them, but it kill's mice by onely smelling thereto. Scorpions, if touched by the root of Aconite, grow numb and torpid, and so die thereof; arrows or darts dipped therein, make incureable wounds. Those who have drunk Aconite, their tongue forthwith waxeth sweet with a certain astriction, which within a while turneth to bitternes; it causeth a *Vertigo*, and shedding of tears, and a heavines or straitnes of the chest and parts about the heart; it make's them break winde downwards, and make's all the bodie to tremble. *Plinie* attribute's so great celeritie and violence to this poison, that if the genitals of female creatures bee touched therewith, it will kill the same daie; there is no presenter remedie then speedie vomiting after the poison is taken. But *Conciliator* think's *Aristolochia* to bee the Antidote thereof. Yet som have made it use ful for man by experimenting it against the stinging of Scorpions, beeing given warm in wine. For it is of such a nature, that it killeth the partie unless it finde something in him to kill, for then it strive's therewith as if it had found an adversarie. But this fight is onely when as it finde's poison in the bodie; and this is marvelous that both the poisons beeing of their own nature deadlie, should die together, that man may by that means live. There are divers sorts thereof, one whereof hath a flower like an helmet, as if it were armed to man's destruction; but the other here delineated hath leavs like to sow's-bread, or a cucumber, and a root like the tail of a Scorpion.

Lib. 27. cap. 2.

Aconite good against the poison of Scorpions.

The differences.

The figure of a certain kinde of Aconite.

The Yew.

* This is true in som countries, as in Provence, Italie, Greece, &c. but it is not so here with us in England, as both Lobel and dailie experience can testifie.

Trees also are not without poison, as the Yew and Walnut tree may witness: Cattel if they feed on the leavs of Yew, are killed therewith. * But men, if they sleep under it, or sit under the shadow thereof, are hurt therewith, and oftimes die thereof. But if they eat it, they are taken with a bloodie flux, and a coldnes over all their bodies, and a kinde of strangling or stoppage of their breath. All which things the Yew causeth, not so much by an elementarie and cold qualitie, as by a certain occult malignitie, whereby it corrupteth the humors, and shaveth the guts. The same things are good against this, as wee have set down against Hemlock; *Nicander* affirm's, that good wine beeing drunken is a remedie thereto. There is also malignitie in a Wall-nut-tree, which *Grevinus* affirm's that hee found by experience, whil'st hee unawares sate under one and slept there in the mid'st of Summer. For wakeing, hee had a sens of cold over all his bodie, a heavines of his head, and pain that lasted six daies. The remedies are the same as against the Yew.

The Antidote.

The Wall-nut tree.

CHAP

CHAP. XXXVI.

Of Bezoar, *and Bezoartick medicines.*

FOR that wee have made mention of *Bezoar*, in treating of the remedies of poisons, I judg I shall not do amiss, if I shall explain, what the word mean's, and the reason thereof. Poison absolutely taken is that which kill's by a certain specifick antipathie contrarie to our nature. So an Antidote or Counter-poison is by the Arabians in their mother-tongue termed *Bedezahar*, as the preservers of life. This word is unknown to the Greeks and Latines, and in use onely with the Arabians and Persians, becaus the thing it self first came from them, as it is plainly shewed by *Garcias ab horto*, Physician to the Vice-roy of the Indies, in his historie of the Spices and *Simples* of the East-Indies. In Persia (saith hee) and a certain part of India is a certain kinde of Goat called *Pazain* (wherefore in proper speaking, the stone should bee termed *Pazar*, of the word *Pazain*, that signifie's a Goat; but wee corruptly term it *Bezar* or *Bezoar*) the color of this beast is commonly reddish, the height thereof indifferent, in whose stomach concrete's the stone called *Bezoar*; it grow's by little and little about a straw or som such like substance in scales like to the scales of an onion, so that when as the first scale is taken off, the next appear's more smooth and shineing as you still take them away, the which amongst others is the sign of good *Bezoar* and not adulterate. This stone is found in sundrie shapes, but commonly it resemble's an Acorn or Date-stone; it is somtimes of a sanguin color, and otherwhiles of a honie-like or yellowish color, but most frequently of a blackish or dark green, resembling the color of mad Apples, or elss of a Civet-Cat. This stone hath no heart nor kernel in the mid'st, but powder in the cavitie thereof, which is also of the same facultie. Now this stone is light and not verie hard, but so that it may easily bee scraped or rasped like alablaster, so that it will dissolv, beeing long macerated in water; at first it was common amongst us, and of no verie great price, becaus our people who trafficked in Persia, bought it at an easie rate. But after that the faculties thereof were found out, it began to be more rare and dear, and it was prohibited by an Edict from the King of the Countrie, that no bodie should sell a Goat to the stranger-Merchants, unless hee first killed him and took forth the stone, and brought it to the King. Of the notes by which the stone is tried, (for there are manie counterfeits brought hither) the first is alreadie declared; the other is, it may bee blown up by the breath, like an oxe's hide; for if the winde break through, and do not stay in the densitie thereof, it is accounted counterfeit. They use it, induced thereto by our example, not onely against poisons, but also against the bites of venemous beasts. The richer sort of the Countrie purge twice a year, to wit, in *March* and *September*; and then, five daies together they take the powder of this stone macerated in Rose-water, the weight of ten grains at a time: for by this remedie they think their youth is preserved, as also the strength of their members. There bee som who take the weight of thirtie drams; yet the more warie exceed not twelv grains. The same Autor addeth that hee useth it with verie good succes in inveterate melancholick diseases, as the itch, scab, tetters and leprosie; therefore by the same reason it may well bee given again a quartane fever. Besides, hee affirmeth for certain that the powder contained in the mid'st of the stone, put upon the bites of venemous beasts, presently free'th the patient from the danger of the poison, as also applied to to pestilent Carbuncles when they are opened, it draw's forth the venom. But becaus the small pocks and meazles are familiar in the Indies, and oftimes dangerous, it is there given with good succes, two grains each daie in Rose-water. *Matthiolus* subscribeth to this opinion of *Garcias*, witnessing that hee hath found it by frequent experience, that this stone by much exceed's not onely other *simple* medicines of this kinde, but also such as are termed *theriacalia*, and what other Antidotes soever. Hereto also consent's *Abdanalarach*; Wee (saith hee) have seen the stone which they call *Bezahar*, with the sons of *Almirama* the observer of the Law of the God; with which stone heee bought a stately and almost princely hous at *Cerduba*.

What poison is.

A sign of true Bezoar.

The use of Bezoar.

Lib. 5. in Dioscor. cap. 73.

Som years ago, a certain Gentleman who had one of these stones which hee brought out of Spain, bragged before King *Charls* then beeing at *Clermount in Avern*, of the most certain efficacie of this stone against all manner of poisons. Then the King asked of mee, whether there were anie Antidote which was equally and in like manner prevalent against all poisons? I answered, that nature could not admit it; for neither have all poisons the like effects, neither do they arise from one caus; for som work from an occult and specifick propertie of their whole nature, others from som elementarie qualitie which is predominant. Wherefore each must bee withstood with its proper and contrarie antidote; as to the hot, that which is cold, and to that which assail's by an occult proprietie of form, another which by the same force to oppugn it, and that it was an easie matter to make trial hereof on such as were condemned to bee hanged. The motion pleased the King, there was a Cook brought by the Jailor who was to have been hanged within a while after for stealiug two silver-dishes out of his master's hous. Yet the King desired first to know of him, whether hee

An historie.

No one thing can bee an Antidote against all poisons.

hee would take the poiſon on this condition, that if the Antidote which was predicated to have ſingular power againſt all manner of poiſons, which ſhould bee preſently given him after the poiſon, ſhould free him from death, that then hee ſhould have his life ſaved. The Cook anſwered chearfully, that hee was willing to undergo the hazard, yea, and greater matters, not onely to ſave his life, but to ſhun the infamie of the death hee was like to be adjudged to. Therefore hee then had poiſon given him by the Apothecarie that then waited, & preſently after the poiſon, ſom of the *Bedezabar* brought from Spain, which beeing taken down, within a while after hee began to vomit, and to avoid much by ſtool with grievous torments, and to crie out that his inward parts were burn't with fire. Wherefore beeing thirſtie, and deſireing water, they gave it him; an hour after, with the good leav of the Jailor, I was admitted to him; I finde him on the ground going like a beaſt upon hands and feet, with his tongue thruſt forth of his mouth, his eies fierie, vomiting, with ſtore of cold ſweats, and laſtly, the blood flowing forth by his ears, noſe, mouth, fundament and yard. I gave him eight ounces of oil to drink, but it did him no good, for it came too late. Wherefore at length hee died with great torment and exclamation, the ſeventh hour from the time that hee took the poiſon beeing ſcarcely paſſed. I opened his bodie in the preſence of the Jailor and four others, and I found the bottom of his ſtomach black and drie, as if it had been burn't with a Cauterie; whereby I underſtood hee had *ſublimate* given him; whoſe force the Spaniſh *Bedezabar* could not repreſs, wherefore the King commanded to burn it.

The cauſtick force of *ſublimate*.

CHAP. XXXVII.

Of Mineral Poiſons.

Minerals or metals are either ſo taken forth of the bowels of the earth, or elſ from fornaces. Of theſe manie are poiſonous, as arſenick, *ſublimate*, *plaſter*, ceruſs, litharg, verdegreaſe, orpiment, filings of Iron, braſs, the load-ſtone, lime and the like. Such as have taken *ſublimate*, the tongue and jaws becom ſtraightned & rough, as if they drunk the juice of unripe *ſervices*: you cannot amend this aſperitie wth lenitive gargariſms but wth labor & time; for aſſoon as it deſcend's into the ſtomach, it ſticketh to it. Therfore preſently after it fret's & exulcerate's; it cauſſeth unquenchable thirſt, and unexplicable torments; the tongue is ſwoln, the heart faint's, the urine is ſuppreſt, the cheſt can ſcarce perform the office of breathing, the bellie is griped, and ſo great pains happen to other extreme parts, that unleſs they bee helped, the patient will die; for preſently will grow upon them, unleſs it bee ſpeedily hindered, the devouring and fierie furie of the poiſon, rending or eating into the guts and ſtomach, as if they were ſeared with an hot iron, and blood floweth out of the ears, noſe, mouth, urinarie paſſage and fundament, and then their caſe is deſperate. Theſe and who elſ ſoever ſhall take anie corrodeing poiſon, ſhall bee cured with the ſame remedies, as thoſe that have taken *Cantharides*.

The ſymptoms of ſuch as have taken *ſublimate*.

Verdegreaſ.

Verdegreaſ ſo ſtop's the inſtruments of reſpiration, that it ſtrangle's ſuch as have taken it. The cure is performed by the ſame remedies as help thoſe that have taken Arſenick.

Litharge.

Litharge cauſſeth a heavineſs in the ſtomach, ſuppreſſeth urine, make's the bodie ſwelled and livid. Wee remedie this, by giveing a vomit preſently, then after it pigeons-dung mixed in ſtrong wine, and ſo drunken. *Peter Aponenſis* wiſheth to give oil of ſweet almonds and figs. Alſo it is good to give relaxing and humecting glyſters, and to annoint the bellie with freſh butter, or oil of lillies.

The ſcales of Braſs.

The ſcales of Braſs drunk by troubling the ſtomach, cauſ a caſting and ſcouring. The remedie is, if the patient forthwith vomit, if hee enter into a bath made of the decoction of Snails, if hee annoint his bellie and breſt with butter or oil of lillies, and inject laxative and humecting glyſters.

The Load-ſtone.

The Load-ſtone make's them mad that take it inwardly. The Antidote thereof is the powder of gold and an emerald drunk in ſtrong wine, and glyſters of milk and oil of ſweet almonds.

Filings of Lead and ſcale of Iron.

The filings of Lead, and the ſcales or *refuſe* of Iron, cauſ great torment to ſuch as take them down. The which wee help with much milk and freſh butter diſſolved therein, or with oil of ſweet almonds drawn without fire, with relaxing and humecting glyſters uſed until the pain bee perfectly aſſwaged.

Arſnick, Roſe-aker or Ratſ-bane.

Riſagallum, Roſe-aker or Katſ-bane, becauſ it is of a moſt hot and drie nature, induce's thirſt and heat over all the bodie, and ſo great colliquation of all the humors, that although the patient by medicines ſpeedily given eſcape death, yet can they not dureing the reſidue of their lives, uſe their members as they formerly did, beeing deſtitute of their ſtrength, by reaſon of the great drineſs and contraction of the joints The Antidote thereof is oil of Pine-kernels ſpeedily given, and that to the quantitie of half a pinte; then procure vomit, then give much milk to drink, and glyſters of the ſame, and let them ſup up fat broths.

Unquench't-Lime and *Auripigmentum*, or Orpiment drunk, gnaw the ſtomach and guts with

with great tormenting pain, and caus unquenchable thirst, an asperitie of the jaws and throat, difficultie of breathing, stopping of the urine, and a bloodie flux. They may bee helped by all fat, humecting, and relaxing things which retund the acrimonie, by lenitive potions, and such things as lubricate the bellie; as also by creams, and the mucilages of som seeds, as with a decoction of the seeds of *Line*, mallows, marsh-mallows and other such things set down at large in the cure of *Cantharides*. Unquenched Lime and Orpiment.

These exceeding acrid and strong waters wherewith Gold-smiths and Chymists separate gold from silver, being taken into the bodie, are hard to cure, becaus they are forthwith diffused over all the bodie, first burning the throat and stomach. Yet it may bee helped by the means prescribed against unquenched Lime and Orpiment. *Aqua fortis.*

Cerus causeth hicketting and a cough, make's the tongue drie, and the extreme parts of the bodie numb with cold, the eies heavie to sleep. The patients verie often in the mid'st of the day see som vain phantasie or apparition, which indeed is nothing; they make a black and oftimes bloodie water, they die strangled unless they bee helped. The Antidote, in the opinion of *Aetius* and *Avicen*, is Scammonie drunk in new wine, or honie and wine, and other diuretick things, and such things as procure vomit, and purge by stool. Cerus.

Plaster, becaus it concreteth and becommeth stonie in the stomach, causeth strangulation, by straitning and stopping the instruments that serv for breathing. The patients receiv cure by the same remedies, as those who have eaten mushorms, or drunk Cerus: you must add Goos-greas in the glysters, and annoint the bellie with oil of lillies and butter. *Plaster.*

CHAP. XXXVIII.

Of Quick-silver.

QUick-silver is so called becaus it resembleth silver in the color, and is in perpetual motion, as if it had a spirit or liveing soul. There is a great controversie amongst autors concerning it. For most of them affirm it hot, among whom is *Galen, Halyabas, Rhases, Aristotle, Constantine, Isack, Platearius, Nicolas Massa*: they maintain their opinion by an argument drawn from things helping and hurting; besides from this, that it is of such subtil parts, that it penetrate's, dissolv's and performeth all the actions of heat upon dens and hard metals; to wit, it attenuateth, incideth, drieth, causeth salivation by the mouth, purgeth by the stool, mooveth urine and sweat over all the bodie, neither doth it stir up the thinner humors onely, but in like sort the gross, tough and viscous, as those which have the *Lues Venerea* finde by expeience, useing it either in ointments or Plasters. The reason why it is so called. *Lib. 4 simp. in 2. practic. c. 148. 3. ad almans. 4. Meteor.*

Others affirm it verie cold and moist, for that put into emplasters and so applied, it asswageth pain by stupefaction, hindering the acrimonie of pustles and cholerick inflammations. But by its humiditie it softeneth scirrhous tumors, dissolveth and dissipateth knots and *topbous* knobs; besides, it causeth the breath of such as are annointed therewith to stink, by no other reason, then that it putrefie's the obvious humor by its great humiditie. *Avicen*'s experiment confirm's this opinion, who affirmeth, that the blood of an Ape that drunk Quick-silver, was found concrete about the heart, the carcas being opened. *Matthiolus* mooved by these reasons, write's that Quick-silver killeth men by the excessive cold and humid qualitie, if taken in a large quantitie, becaus it congeal's the blood and vital spirits, and at length the verie substance of the heart, as may bee understood by the historie of a certain Apothecarie, set down by *Conciliator*; who, for to quench his feverish heat, in stead of water, drunk off a glas of Quick-silver, (for that came first to his hands;) he died within a few hours after, but first hee evacuated a good quantitie of the Quick-silver by stool, the residue was found in his stomach beeing opened, and that to the weight of one pound; besides, the blood was found concrete about his heart. Others use another argument to proov it cold, and that is drawn from the composition thereof, becaus it consist's of Lead and other cold metals. But this argument is verie weak. For unquench't Lime is made of flints and stonie matter, which is cold, yet nevertheless it exceed's in heat. *Paracelsus* affirmeth that Quick-silver is hot in the interior substance, but cold in the exterior, that is, cold as it com's forth of the *Mine*. But that coldnes to bee lost as it is prepared by art, and heat onely to appear and bee left therein, so that it may serv in stead of a tincture in the transmutation of metals. And verily it is taken for a rule amongst Chymists, that all metals are outwardly cold, by reason of the waterie substance that is predominant in them, but that inwardly they are verie hot, which then appear's when when as the coldnes together with the moisture is segregated; for by calcination they becom causticke. Moreover manie account quick-silver poison, yet experience denie's it. For *Marianus Sanctus Boralitanus* tell's that hee saw a woman, who for certain causes and effects, would at several times drink one pound and a half of quick-silver, which came from her again by stool without anie harm. Moreover hee affirmeth that hee hath known sundrie who in a desperate Colick (which they commonly call *miserere mei*) have been free'd from imminent death, by drinking three pound of quick-silver with water

In l. 6. Dios. c. 28 An historie. *Lib. 4. de nat. rerum. Tract. de cas & effect.*

ter onely. For by the weight it open's and unfold's the twined or bound up gut, and thruſt's forth the hard and ſtopping excrements; hee addeth that others have found this medicine effectual againſt the colick, drunk in the quantitie of three ounces. *Antonius Muſa* write's, that hee uſually giveth Quick-ſilver to children readie to die of the worms. *Avicen* confirmeth this, averring that manie have drunk Quick-ſilver without anie harm, wherefore hee mixeth it in his ointments againſt ſcales and ſcabs in little children; whence came that common medicine amongſt countrie people to kill lice by annointing the head with Quick-ſilver mixed with butter or *axungia*. *Matthiolus* affirmeth that manie think it the laſt and chiefeſt remedie to give to women in travel that cannot bee delivered. I proteſt to ſatiſfie my ſelf concerning this matter, I gave to a whelp a pound of Quick-ſilver, which beeing drunk down, it voided without anie harm by the bellie. Whereby you may underſtand that it is wholly without anie venemous qualitie. Verily it is the onely and true Antidote of the *Lues Venerea*, and alſo a verie fit medicine for all malign ulcers, as that which more powerfully impugn's their malignitie then anie other medicines that work onely by their firſt qualities. Beſides, againſt that contumacious ſcab, which is vulgarly called *Malum ſancti manis*, there is not anie more ſpeedie or certain remedie. Moreover *Guido* write's, that if a plate of lead bee beſmeared or rubbed there with, and then for ſom ſpace laid upon an ulcer, and conveniently faſtned, that it will ſoften the callous hardneſs of the lips thereof, and bring it to cicatrization, which thing I my ſelf have oftimes found true by experience.

Quick-ſilver good for women in travel.

For the diſeaſ called *Malum ſancti manis*.

Certainly before *Guido*, *Galen* much commended Quick-ſilver againſt malign ulcers and cancers. Neither doth *Galen* affirm that lead is poiſonous (which manie affirm poiſonous, becauſ it conſiſt's of much Quick-ſilver) but hee onely ſaith thus much, that water too long kept in leaden pipes and ciſterns, by reaſon of the droſſineſs that it uſeth to gather in lead, cauſeth bloodie fluxes, which alſo is familiar to braſs and copper. Otherwiſe manie could not without danger bear in their bodies leaden bullets during the ſpace of ſo manie years, as uſually they do. It is reported. It is declared by *Theodoret Herey* in the following hiſtories, how powerful Quick-ſilver is to reſolv and aſſwage pains and inflammations. Not long ſince, (ſaith hee) a certain Doctor of Phyſick his boy was troubled with *parotides*, with great ſwelling, heat, pain and beating; to him by the common conſent of the Phyſicians ther preſent, I applied an *Anodine* medicine, whoſe force was ſo great, that the tumor manifeſtly ſubſided at the firſt dreſſing, and the pain was much aſſwaged. At the ſecond dreſſing all the ſymptoms were more mitigated. At the third dreſſing, I wondring, at the ſo great effect of an *Anodine* Cataplaſm, obſerved that there was Quick-ſilver mixed therewith, and this happened through the negligence of the Apothecarie, who mixed the ſimple *Anodine* medicine preſcribed by us, in a mortar wherein but a while before hee had mixed an ointment wherinto Quick-ſilver entred, whoſe reliqus, and ſom part thereof yet remained therein. This which once by chance ſucceeded well, I afterwards wittingly and willingly uſed to a certain Gentle-woman troubled with the like diſeaſ, poſſeſſing all the region behinde the ears, much of the throat, and a great part of the cheek, when as nature helped by common remedies, could not evacuate neither by reſolution nor ſuppuration, the contained matter greatly vexing her with pain and pulſation. I to the medicine formerly uſed, by the conſent of the Phyſicians, put ſom Quick-ſilver, ſo within a few daies, the tumor was digeſted and reſolved. But ſom will ſay, it reſolves the ſtrength of the nerves and limbs, as you may ſee by ſuch as have been annointed therewith for the *Lues Venerea*, who tremble in all their limbs dureing the reſt of their lives. This is true, if any uſe it too intemperately without meaſure, and a diſeaſ that may require ſo great a remedie; for thus wee ſee the Gilders, Plumbers and ſuch as dig in mines, by the continual aſcent of the vapors of Quick-ſilver to the brain, the fountain of the nervs, by reſolving the ſpirits, and diſſipating the radicall and ſubſtantiſick moiſture, maketh them ſubject to the trembling of their joints. Verily, if it bee killed and incorporate with hogs-greaſ, and a liſt beſmeared therewith, which may encompaſs the bodie like a girdle, it will drive away lice, fleas and *cimices*; and annointed about the navel, it kill's the worms in the guts. There are two ſorts of Quick-ſilver, the one natural, the other artificial. The natural is found running or flowing in the veins and bowels of the earth, and amongſt metals, and in the fornaces of ſilver-mines. The Artificial is made of *minium* (as it is in *Vitruvius*) and of the powder of Ivorie. Alſo it is probable that by art it may bee extracted out of all metals, but chiefly out of Lead and *Cinnabaris*. You may eaſily diſtinguiſh theſe kindes by the dull and blackiſh color, tough and groſs ſubſtance, which as it run's, leav's an impreſſion like melted greaſ, beeing as it were the excrement of lead. The beſt Quick-ſilver of all is pure, clear, thin, and verie white: it may bee cleanſed with the droſs of lead, and becom's more then beeing boiled in ſharp vineger, with *ſage*, roſemarie, *time*, lavander,. Or elſ give it by a pound at a time to a whelp, to drink down, and beeing caſt forth by it, boil it again in vineger, for thus it hath wondrous faculties, and fitly given produceth marvelous effects; nothing is more contrarie thereto then fire. For Quick-ſilver, though of its own nature ponderous, flieth upwards by the force of the fire, and forſaketh gold by that means, then which nothing is more friendlie to it.

Lib. de comp. med. ſecund. loc. Againſt malign ulcers.

Againſt the *Parotides*.

Againſt lice and fliez, &c. The kindes thereof.

How to purifie it.

CHAP.

CHAP. XXXIX.

Of the Unicorn's horn.

THere are verie manie at this daie who think themselvs excellently well armed against poison and all contagion, if they bee provided with som powder of Unicorns-horn, or som infusion made therewith. Therefore I have thought it good to examine more diligently how much truth this inveterate, and grounded opinion hath. The better to perform this task, I will propound three heads, whereto I will direct my whole discours. The first shall bee of the signification of this word *Unicorn*. The second, whether there bee anie such thing really and truly so called, or whether it bee not rather imaginarie; like as the *Chimera* and *Tragelaphus*? The third, whether that which is said to bee the horn of such a beast, hath anie force or facultie against poisons? For the first, that is, the name, it is somwhat more obscure what the word (*beeing Licorn*) in French may signifie, then what the Latin or Greek word is. For the French name is further from the word and signification; but it is so clear and manifest, that this word *Unicornis* amongst the Latines signifieth a beast haveing but one horn, as it is vulgarly known; the same thing is meant by the Greek word *Monoceros*. But now for the second, I think that beast that is vulgarly called and taken for an Unicorn, is rather a thing imaginarie then really in the world. I am chiefly induced to believ thus, by these conjectures. Becaus of those who have travelled over the world, there is not one that professeth that ever hee did see that creature. Certainly the Romans conquered the world, and beeing most diligent searchers after all things which were rare and so excellent, if anie where in anie corner of the world this beast could have been found, they would have found it out, and engraven it upon their coins, or arms, as they did Crocodiles, Elephants, Eagles, Panthers, Lions, Tigers, and other creatures unknown to these countries. For these that have written of the Unicorn, either that they have heard, or that hath bren delivered by tradition, or what they in their own mindes and fancies have conceived, you shall scarce finde two that agree together, either in the description of the bodie, or in the nature and condition of her. *Plinie* write's, that Unicorns are for the fashion of their bodies like to an Horse; that is, as *Cardane* interpret's it, of the bigness of an Horse, with the head of an Hart, the feet of an Elephant, the tail of a *Bore*, with one black horn in the mid'st of his fore-head, of the length of two cubits. *Munster*, who (as *Matthiolus* jest's) never saw Unicorns, besides painted ones, doth on the contrarie affirm them not to bee of the bigness of an Horse, but of an Hinde-calf of three months old, not with feet like an Elephant, but cleft like those of Goats, with an horn not onely of two, but oftimes of three cubits long, of a Weazel-color, with a neck not verie long, nor verie hairie, but haveing few and short hairs hanging to the one side of the neck, the legs are lean and small, the buttocks high, but verie hairie. *Cardane* dissenting from both these, write's, that hee hath an horn in the mid'st of his fore-head, but that it is onely the length of three fingers. *Andrew Thevet* mention's an Unicorn seen by a certain Turkish Sangjach, which was of the bigness of a Bull of five or six moneths old, and had one horn, but that not in the mid'st of the fore-head, but upon the top of the crown of the head; hee was legg'd and footed like an Ass, but longer haired, and had ears not much unlike the *Rangifer*, a beast not unknown in the *subpolare* or northern countries.

what the name imports.

That there is no such beast as an *Unicorn*.

Lib. 8. cap. 21.

Munsters opinion concerning *unicorns*.

Tom. 1. lib. 5. cap. 5. cosmogr.

Thus various therefore is the report concerning the shape of this Beast. Neither is there less difference concerning her nature and conditions. For *Plinie* write's, that the Unicorn is a most fierce beast, and hath a great bellowing voice, and that shee cannot therefore bee taken alive. *Cardane* render's a reason of this fiercenes, *Becaus* (saith hee) *it inhabit's the deserts of Æthiopia, a region squalid, and filthie, abounding with Toads, and such like venemous creatures*. Others on the contrarie affirm her to bee of a most milde, amiable, and gentle nature of all others, unless one purposely offend her, or use her too harshly; for seeing shee feed's not by stooping her head to the ground, becaus shee is hindered therefrom by the length of her horn, shee must necessarily feed upon the fruit that hangeth upon trees; out of cratches or man's hand shee fercelesly and harmlesly takes all manner of fruits, herbs, sheaves of corn, apples, pears, oranges and puls. And herein they have proceeded so far, that they feign they will love Virgins, entised by their beautie, so that staied in the contemplation of them, and allured by their entisements, they by this means are often taken by hunters. In this opinion is *Lewes Vartoman*, who denies that Unicorns are wilde or fierce; for hee saith that hee saw two, which were sent out of *Ethiopia* to the Sultan, who kept them shut up in *Persis*, in *Mecha*, a citie of *Arabia felix*, renowned by the Sepulcher of *Mahomet*. *Thevet* traveling thither, tel's that hee diligently inquired of the inhabitants, what there opinion was of such a beast, yet could hee never hear anie tidings thereof. Whence it is easie to discern, that such beasts have neither been in our, nor in *Vartoman's* times. The so great varietie of dissenting opinions, easily induceth mee to beleiv that this word, *Unicorn*, is not the proper name of anie beast in the world, and that it is a thing onely feigned by Painters, and Writers of natural things, to delight the readers and beholders. For as there is but one right waie, but

Vartomans opinion of the nature of the *unicorn*.

manie by-waies and windeings, ſo the ſpeech of truth is but one, and that alwaies ſimple and like it ſelf; but that of a lie is diverſ, and which may eaſily refel it ſelf, by the repugnancie and incongruitie of opinions, if one ſhould ſay nothing. What therefore (will ſom ſay) of what creatures are theſe horns, which wee ſee wholly different from others, if they bee not of Unicorns? *Thevet* think's them nothing elſ then Elephants bones turned and made into the faſhion that wee ſee them; for thus in the Eaſtern Countries, ſom craftie merchants and cunning companions turn, hollow, and beeing ſoftened, draw to what length they pleaſ the teeth of the fiſh Rohard, which live's in the Red and Ethiopian Sea, and beeing ſo handled, they ſell them for Unicorn's horn. Verily that which is termed Unicorn's horn, beeing burnt, ſend's forth a ſmell like to Ivorie. Now *Cardanus* affirm's that the teeth and bones of Elephants made ſoft by art, may bee drawn forth, and brought into what form you pleaſ, like as Ox-bones are. For what is there in the world which the thirſting deſire of gold will not make men to adulterate and counterfeit? But it is time that wee com to the third ſcope. Grant there bee Unicorns, muſt it therefore follow that their horns muſt bee of ſuch efficacie againſt poiſons? If wee judg by events, and the experience of things, I can proteſt thus much, that I have often made trial thereof, yet could I never finde anie good ſucceſs in the uſe thereof againſt poiſons, in ſuch as I have had in cure. If the matter muſt bee tried by witneſſes and autorities, a great part of the Phyſicians of better note have long ſince bid it adieu, and have detracted from the divine and admirable vertues for which it formerly was ſo much deſired. And this they have don, mooved thereto by manie juſt, but two eſpecial reaſons. The firſt is of *Rondeletius*, who in this caſe affirm's that horns are endued with no taſte nor ſmell; and therefore have no effect in phyſick, unleſs it bee too drie. Neither (ſaith hee) am I ignorant that ſuch as have them, much predicate their worth, ſo to make the greater benefit and gain by them, as of the ſhaveings or ſcrapeings of Unicorn's horn, which they ſell for the weight in gold, as that which is ſingular good againſt poiſons and worms; which things, I think, Hart's-horn and Ivorie do no leſs effectually perform; which is the cauſ why, for the ſame diſeaſ, and with the like ſucceſs, I preſcribe Ivorie to ſuch as are poor, and Unicorn's horn to the rich, as that they ſo much deſire. This is the opinion of *Rondeletius*, who, without anie difference, was wont, for Unicorn's horn, to preſcribe not onely Hart's-horn or Ivorie, but alſo the bones of Horſes and Dogs, and the ſtones of Myrabalanes. Another reaſon is, that whatſoever reſiſt's poiſon is cordial, that is, fit to ſtrengthen the heart, which is chiefly aſſailed by poiſons; but nothing is convenient to ſtrengthen the heart, unleſs it bee by laudable blood or ſpirit, which two are onely familiar to the heart, as beeing the workhouſ of the arterious blood and vital ſpirits. For all things are preſerved by their like, as they are deſtroied by their contraries; for all things that generate, generate things like themſelvs. But Unicorn's horn, as it contain's no ſmell, ſo neither hath it anie aërie parts, but is wholly earthie and drie; neither can it bee converted into blood by the digeſtive faculcie, for as it is without juice, ſo is it without fleſh. For as it cannot bee turned into *Chylus*, ſo neither is it fit to becom *Chymus*, that is, juice or blood. Therefore it is joined to the heart by no ſimilitude, nor familiaritie. Furthermore, there is not a word in *Hippocrates* and *Galen* concerning the Unicorn's horn, who notwithſtanding have in ſo manie places commended Hart's-horn. Therefore D. *Chapelain*, the chief Phyſician of King *Charles* the Ninth, often uſed to ſay, that hee would verie willingly take away that cuſtom of dipping a piece of Unicorn's horn in the King's cup, but that hee knew that opinion to bee ſo deeply ingraffed in the mindes of men, that hee feared, that it would ſcarce bee impugned by reaſon. Beſides (hee ſaid) if ſuch a ſuperſtitious medicine do no good, ſo certainly it doth no harm, unleſs it bee to their eſtates that buy it with gold, or elſ by accident, becauſ Princes, whil'ſt they relie more then is fitting upon the magnified virtues of this horn, neglect to arm themſelvs againſt poiſons by other more convenient means, ſo that death oftimes take's them at unawares. When as upon a time I inquired of *Lewes Duret* the Kings Phyſician and Profeſſor (by reaſon of the great opinion that all learned men juſtly had of his learning and judgment) what hee thought of this horn; Hee anſwered, that hee attributed no faculties thereto: for the confirmation whereof hee rendred the ſecond reaſon I have formerly given, but more largely and elegantly; neither feared hee to affirm it aloud, and in plain words to his auditorie of learned men, comming from all parts to hear him. But if at anie time (ore'com by the fault of the times and place) hee preſcrib'd this horn; that hee did it for no other intent, then to help faintings or ſwoundings that happen by the abundance of ſerous humors, floating in the orifice of the ventricle, which make's men ill diſpoſed, becauſ this mixed with other things endued with the like facultie, hath power to drink up the wateriſh humiditie by its earthie drieneſs. But ſom will replie, that neither the Lemnian, nor Armenian earth, have anie juice in them, neither anie ſmell, nor aërie ſpirit. It is granted; neither truly are ſuch things truly and properly called cordial, but onely by event and accident, for that by the excellent aſtrictive faculcie they have, and ſtopping the paſſages of the veſſels, they hinder the poiſon from entring into the heart. This is my opinion of Unicorn's horn, which if anie do not approov of, hee ſhall do mee a favor, if for the publick good, hee ſhall freely oppoſe his; but in the *interim* take this in good part which I have don.

The end of the one and twentieth Book.

What the ordinarie Unicorns horns are.

The Unicorn's horn is not effectual againſt poiſon.

Lib. de pondere. cap. 19.

Horns and bones not effectual unleſs to drie.

In what caſes good.

Of the PLAGUE.

The twentie second Book.

CHAP. I.

The description of the Plague.

THE Plague is a cruel and contagious diseas, which everie-where, like a common diseas, invadeing Man and Beast, kill's verie manie; being attended, and as it were associated with a continual fever, botches, carbuncles, spots, nauseousnes, vomitings, and other such malign accidents. This diseas is not so pernicious or hurtful, by anie elementarie qualitie, as from a certain poisonous and venenate malignitie, the force whereof exceed's the condition of common putrefaction. Yet I will not denie, but that it is more hurtful in certain bodies, times and regions, as also manie other diseases, of which *Hippocrates* make's mention. But from hence wee can onely collect, that the force and malignitie of the plague may bee encreased, or diminished, according to the condition of the elementarie qualities concurring with it; but not the whole nature and essence thereof to depend thereon. What the Plague is. *Sect. 3. aphor.*

This pestiferous poison principally assail's the vital spirit, the store-hous and original whereof is the heart, so that if the vital spirit proov stronger, it drive's it far from the heart; but if weaker, it beeing overcom and weakned by the hostile assault, flie's back into the fortres of the heart, by the like contagion infecting the heart, and so the whole bodie, beeing spread into it by the passages of the arteries. How it com's to kill.

Hence it is, pestilent fevers are somtime simple and solitarie; other-whiles associated with a troop of other affects, as botches, carbuncles, blanes and spots, of one or more colors.

It is probable such affects have their original from the expulsive facultie, whether strong or weak, provoked by the malignitie of the rageing matter: yet assuredly divers symptoms and changes arise, according to the constitution of the bodie of the patient, and condition of the humor in which the virulencie of the plague is chiefly inherent, and lastly, in the nature of the efficient caus. The original buboes, carbuncles, &c. in the plague.

I thought good, by this description, to expres the nature of the plague, at this my first entrance into this matter; for wee can scarce comprehend it in a proper definition. For although the force thereof bee definite, and certain in nature, yet it is not altogether certain and manifest in mens mindes, becaus it never happen's after one sort: so that in so great varietie, it is verie difficult to set down anie thing general and certain.

CHAP. II.

Of the Divine causes of an extraordinarie Plague.

IT is a confirmed, constant, and received opinion in all Ages amongst Christians, that the plague and other diseases, which violently assail the life of man, are often sent by the just anger of God punishing our offences. The Prophet *Amos* hath long since taught it, saying, *Shall there bee affliction? shall there bee evil in a Citie, and the Lord hath not don it?* On which truly wee ought daily to meditate, and that for two causes: The first is, that wee alwaies bear this in minde, that wee enjoy health, live, move, and have our beeings from God, and that it descend's from that Father of Light; and for this caus wee are alwaies bound to give him great and exceeding thanks. The other is, that knowing the calamities, by sending whereof the Divine anger proceed's to revenge, wee may at length repent, and leaving the way of wickednes, walk in the paths of godlines. For thus wee shall learn to see in God, our selvs, the Heaven and Earth, the true knowledg of the causes of the plague, and by a certain Divine Philosophie teach, God to bee the beginning and caus of the second causes, which cannot well without the first caus go about nor attempt, much les perform anie thing. For from hence they borrow their force, order, and constancie of order; so that they serv as instruments for God, who rule's and govern's us, and the whole world, to perform all his works, by that constant cours of order, which hee hath appointed unchangeable from the beginning. Wherefore all the caus of a plague is not to bee attributed to these near and inferior causes or beginnings, as the Epicures and Lucianists commonly *Amos 3. Acts 17.* The second causes have their power from God as the first caus.

commonly do, who attributeing too much, yea all things to Nature, have left nothing to God's providence. On the contrarie, wee ought to think, and beleev in all our things, That even as God by his omnipotent Power hath created all things of nothing, so hee by his eternal Wisdom preserv's and govern's the same, lead's and incline's them as hee pleaseth, yea verily at his pleasure changeth their order, and the whole cours of nature.

This caus of an extraordinarie Plague, as wee confess and acknowledg, so here wee will not prosecute it anie further, but think fit to leav it to Divines, becaus it exceed's the bounds of Nature, in which I will now contain my self. Wherefore let us com to the natural causses of the Plague.

CHAP. III.

Of the Natural causses of the Plague, and chiefly of the Seminarie of the Plague by the corruption of the Air.

The general causses of the Plague. *Lib. 6. de loc. affect.*

THe general and natural causses of the Plague are absolutely two, that is, the infection of corrupt air, and a preparation and fitnes of corrupt humors to take that infection; for it is noted before out of the doctrine of *Galen*, that our humors may bee corrupted, and degenerate into such an alienation which may equal the malignitie of poison.

How the seasons of the year may bee said to want their seasonableness.

The air is corrupted, when the four seasons of the year have not their seasonableness, or degenerate from themselvs, either by alteration, or by alienation: as if the constitution of the whole year bee moist and rainie, by reason of gross and black clouds; if the Winter bee gentle and warm, without anie Northerly winde, which is cold and drie, and by that means contrarie to putrefaction; if the Spring, which should bee temperate, shall bee faultie in anie excess of distemper; if the Autumn shall bee ominous by fires in the air, with stars shooting, and as it were falling down, or terrible comets, never seen without som disaster; if the Summer bee hot, cloudie and moist, and without windes, and the clouds flie from the South into the North. These and such like unnatural constitutions of the seasons of the year, were never better, or more excellently handled by anie, then by *Hippocrates* in his Books *Epidemion*. Therefore the air from hence draw's the seeds of corruption and the pestilence, which at length, the like excess of qualities beeing brought in, it send's into the humors of our bodies, chiefly such as are thin and *serous*. Although the pestilence doth not alwaies necessarily arise from hence, but som-whiles som other kinde of cruel and infectious disease.

How the air may bee corrupted.

But neither is the air onely corrupted by these superior causses, but also by putrid and filthie stinking vapors spread abroad through the air encompassing us, from the bodies and carkasses of things not buried, gapeings and hollowness of the earth, or sinks and such like places beeing opened: for the sea often overflowing the land in som places, and leaving in the mud or hollowness of the earth (caussed by earth-quakes) the huge bodies of monstrous fishes, which it hide's in its waters, hath given both the occasion and matter of a plague. For thus in our time, a Whale cast upon the Tuscan shore, presently caussed a plague over all that countrie.

But as fishes infect and breed a plague in the air, so the air beeing corrupted often, causseth a pestilence in the sea among fishes, especially when they either swim on the top of the water, or are infected by the pestilent vapors of the earth lying under them, and riseing into the air through the bodie of the water, the later whereof *Aristotle* saith, hapneth but seldom. But it often chanceth, that the plague rageing in anie countrie, manie fishes are cast upon the coast, and may bee seen lying on great heaps. But sulphureous vapors, or such as partake of anie other malign qualitie, sent forth from places under the ground, by gapeings and gulfs opened by earth-quakes, not onely corrupt the air, but also infect and taint the seeds, plants, and all the fruits which wee eat, and so transfer the pestilent corruption into us, and those beasts on which wee feed, together with our nourishment. The truth whereof *Empedocles* made manifest, who by shutting up a great gulf of the earth, opened in a vallie between two mountains, free'd all Sicilie from a plague caussed from thence.

Lib. 8. hist. anim.

If windes riseing suddenly shall drive such filthie exhalations from those regions in which they were pestiferous, into other places, they also will carrie the plague with them thither.

If it bee thus, som will say, it should seem that wheresoever stinking and putrid exhalations arise, as about standing-pools, sinks and shambles, there should the Plague reign, and straight suffocate with its noisom poison the people which work in such places: but experience finde's this false.

Pestiferous putrefaction is far different from ordinarie putrefaction.

Wee do answer, that the putrefaction of the Plague is far different, and of another kinde then this common, as that which partake's of a certain secret malignitie, and wholly contrarie to our lives, and of which wee cannot easily give a plain and manifest reason. Yet that vulgar putrefaction wheresoever it bee, doth easily and quickly entertain and welcom the pestiferous contagion, as often as, and whensoever it com's, as joined to it by a certain familiaritie,

familiaritie, and at length, it self degenerateing into a pestiferous malignitie, certainly no otherwise then those diseases which arise in the plague-time, the putrid diseases in our bodies, which at the first wanted virulencie and contagion, as Ulcers, putrid Fevers, and other such diseases, raised by the peculiar default of the humors, easily degenerate into pestilence, presently receiving the tainture of the plague, to which they had before a certain preparation. Wherefore in time of the plague, I would advise all men to shun such exceeding stinking places, as they would the plague it self: that there may bee no preparation in our bodies, or humors to catch that infection (without which, as *Galen* teacheth, the Agent hath no power over the Subject, for otherwise in a plague-time, the sickness would equally seiz upon all) so that the impression of the pestiferous qualitie may presently follow that disposition.

In a pestilent constitution of the air, all diseases becom pestilent. *Lib.1.de differ. feb.*

But when wee say the air is pestilent, wee do not understand that sincere, elementarie, and simple as it is of its own nature, for such is not subject to putrefaction; but that which is polluted with ill vapors riseing from the earth, standing-waters, vaults, or sea, and degenerate's, and is changed from its native puritie and simplicitie. But certainly amongst all the constitutions of the air, fit to receiv a pestilent corruption, there is none more fit then an hot, moist and still season; for the excess of such qualities easily causseth putrefaction. Wherefore the South winde reigning, which is hot and moist, and principally in places near the sea, there flesh cannot long bee kept, but it presently is tainted and corrupted.

How the air may bee said to putrefie.

A Southerly constitution of the air is the fuel of the Plague.

Further, wee must know, that the pestilent malignitie which riseth from the carkasses or bodies of men, is more easily communicated to men; that which riseth from oxen, to oxen; and that which com's from sheep, to sheep; by a certain sympathie and familiaritie of Nature: no otherwise then the Plague which shall seiz upon som one in a Familie, doth presently spread more quickly amongst the rest of that Familie, by reason of the similitude of temper, then amongst others of another Familie, disagreeing in their whole temper. Therefore the air thus altered and estranged from its goodness of nature, necessarily drawn in by inspiration and transpiration, bring's in the seeds of the Plague, and so consequently the Plague it self, into bodies prepared and made readie to receiv it.

CHAP. IV.

Of the preparation of humors to putrefaction, and admission of pestiferous impressions.

HAveing shewed the causses from which the air doth putrefie, becom corrupt, and is made partaker of a pestilent and poisonous constitution; wee must now declare what things may caus the humors to putrefie, and make them so apt to receiv and retain the pestilent air and venenate qualitie.

Three causses of the putrefaction of humors.

Humors putrefie either from fulness, which breed's obstruction; or by distemperate excess; or lastly, by admixture of corrupt matter and evil juice, which ill feeding doth specially caus to abound in the bodie: For the Plague often follow's the drinking of dead and mustie wines, muddie and standing water, which receiv the sinks and filth of a Citie; and fruits and puls eaten without discretion in scarcitie of other corn, as Peas, Beans, Lentils, Vetches, Acorns, the roots of Fern, and Grass made into bread. For such meats obstruct, heap up ill humors in the bodie, and weaken the strength of the faculties, from whence proceed's a putrefaction of humors, and in that putrefaction a preparation and disposition to receiv, conceiv, and bring forth the seeds of the Plague: which the filthie scabs, malign sores, rebellious ulcers, and putrid fevers, beeing all fore-runners of greater putrefaction and corruption, do testifie. Vehement passions of the minde, as anger, sorrow, grief, vexation and fear, help forward this corruption of humors, all which hinder nature's diligence and care of concoction: For as in the Dog-Daies, the lees of wine subsideing to the bottom, are by the strength and efficacie of heat drawn up to the top, and mixed with the whole substance of the wine, as it were by a certain ebullition, or working; so melancholick humors, beeing the dregs or lees of the blood, stirred up by the passions of the minde, defile or taint all the blood with their feculent impuritie.

Passions of the minde help forward the putrefaction of the humors.

Wee found that som years agon by experience, at the battel of S. *Dennis*. For all wounds, by what weapon soever they were made, degenerated into great and filthie putrefactions and corruptions, with fevers of the like nature, and were commonly determined by death, what medicines, and how diligently soever they were applied; which caussed manie to have a fals suspicion that the weapons on both sides were poisoned. But there were manifest signs of corruption and putrefaction in the blood *let* the same day that anie were hurt, and in the principal parts dis-sected afterwards, that it was from no other caus, then an evil constitution of the air, and the mindes of the Souldiers perverted by hate, anger and fear.

CHAP. V.

What signs in the Air and Earth prognosticate a Plague.

WEe may know a Plague to bee at hand and hang over us, if at anie time the air and seasons of the year swarv from their natural constitution, after those waies I have mentioned before; if frequent and long continuing Meteors, or sulphureous Thunders infect the air; if fruits, seeds and pulſ bee worm-eaten: If Birds forsake their nests, eggs or young, without anie manifest cauſ; if wee perceiv women commonly to abort, by continual breathing in the vaporous air, beeing corrupted and hurtful both to the Embryon and original of life, and by which it beeing suffocated, is presently cast forth and expelled. Yet notwithstanding, those airie impressions do not solely corrupt the air, but there may bee also others raised by the Sun from the filthie exhalations and poisonous vapors of the earth and waters, or of dead carkasses, which by their unnatural mixture, easily corrupt the air, subject to alteration, as which is thin and moist, from whence divers Epidemial diseases, and such as everie-where seiz upon the common sort, according to the several kindes of corruptions, such as that famous *Catarrh* with difficultie of breathing, which in the year 1510 went almost over all the world, and raged over all the Cities and Towns of France, with great heavinesse of the head (whereupon the French named it *Cuculla*) with a straightnesse of the heart and lungs, and a cough, a continual fever, and somtimes raveing.

Why abortions are frequent in a pestilent season.

A *Catarrh* with difficultie of breathing killing manie.

This, although it seized upon manie more then it killed, yet becauſ they commonly died who were either let blood, or purged, it shewed it self pestilent by that violent and peculiar and unheard of kinde of malignitie.

The English *Sweating-sickness.*

Such also was the English *Sweating-sickness*, or *Sweating-fever*, which unusual, with a great deal of terror invaded all the lower parts of Germanie, and the Low-Countries, from the year 1525 unto the year 1530, and that chiefly in Autumn.

As soon as this pestilent disease entred into anie Citie, suddenly two or three hundred fell sick on one day, then it departed thence to som other place. The people strucken with it languishing, fell down in a swound, and lying in their beds, sweat continually, haveing a fever, a frequent, quick, and unequal pulſ; neither did they leav sweating, till the diseas left them, which was in one or two daies at the most: yet free'd of it, they languished long after, they all had a beating, or palpitation of the heart, which held som two or three years, and others all their life after.

At the first beginning it killed manie, before the force of it was known: but afterwards verie few, when it was found out by practice and use, that those who furthered and continued their sweats, and strengthened themselvs with cordials, were all restored. But at certain times many other popular diseases sprung up, as putrid fevers, fluxes, bloodie-fluxes, catarrhs, coughs, phrenzies, squinances, pluriſies, inflammations of the lungs, inflammations of the eies, apoplexies, lithargies, small pocks and meazles, scabs, carbuncles, and malign pustles. Wherefore the Plague is not alwaies, nor everie-where of one and the same kinde, but of divers; which is the cauſ that divers names are imposed upon it, according to the varietie of the effects it bring's, and symptoms which accompanie it, and kindes of putrefaction, and hidden qualities of the air.

The Plague is not the definite name of one disease.

They affirm, when the Plague is at hand, that Mushroms grow in greater abundance out of the earth, and upon the surface thereof manie kindes of poisonous *insecta* creep in great numbers, as Spiders, Caterpillers, Butter-flies, Grass-hoppers, Beetles, Hornets, Wasps, Flies, Scorpions, Snails, Locusts, Toads, Worms, and such things as are the off-spring of putrefaction. And also wilde beasts tired with the vaporous malignitie of their dens and caves in the earth, forsake them; and Moles, Toads, Vipers, Snakes, Lizards, Asps and Crocodiles are seen to flie away, and remoov their habitations in great troops. For these, as also som other creatures, have a manifest power by the gift of God, and the instinct of Nature, to presage changes of weather, as rains, showrs, and fair weather; and seasons of the year, as the Spring, Summer, Autumn, Winter, which they testifie by their singing, chirping, crying, flying, playing, and beating with their wings, and such like signs: so also they have a perception of a Plague at hand. And moreover, the carkasses of som of them which took less heed of themselvs, suffocated by the pestiferous poison of the ill air contained in the earth, may bee everie-where found, not onely in their dens, but also in the plain fields.

What signs in the earth foretell a Plague.

These vapors corrupted not by a simple putrefaction, but an occult malignitie, are drawn out of the bowels of the earth into the air, by the force of the Sun and Stars, and thence condensed into clouds, which by their falling upon corn, trees and grass, infect and corrupt all things which the earth produceth, and also kill's those creatures which feed them; yet brute beasts sooner then men, as which stoop and hold their heads down towards the ground (the maintainer and breeder of this poison) that they may get their food from thence. Therefore at such times, skilful husbandmen, taught by long experience, never drive

How pestilent vapors may kill plants and trees.

their

their Cattel or Sheep to paſture, before that the Sun, by the force of his beams, hath waſted and diſſipated into air this peſtiferous dew hanging and abideing upon boughs and leavs of trees, herbs, corn and fruits.

But on the contrarie, that peſtilence which proceed's from ſom malign qualitie from above, by reaſon of evil and certain conjunction of the Stars, is more hurtful to men and birds, as thoſe who are nearer to heaven.

CHAP. VI.

By uſeing what cautions in Air and diet, one may prevent the Plague.

HAveing declared the ſigns fore-ſhewing a Peſtilence: now we muſt ſhew by what means wee may ſhun the imminent danger thereof, and defend our ſelvs from it. No prevention ſeemed more certain to the Antiens, then moſt ſpeedily to remoov into places far diſtant from the infected place, and to bee moſt ſlow in their return thither again. But thoſe, who by reaſon of their buſineſs or emploiments, cannot change their habitation, muſt principally have a care of two things: The firſt is, that they ſtrengthen their bodies, and the principal parts thereof againſt the dailie imminent invaſions of the poiſon, or the peſtiferous and venenate Air. The other, that they abate the force of it, that it may not imprint its virulencie in the bodie; which may bee don by correcting the exceſs of the qualitie inclineing towards it, by the oppoſition of its contrarie. For if it bee hotter then is meet, it muſt bee tempered with cooling things; if too cold, with heating things: yet this will not ſuffice. For wee ought beſides, to amend and purge the corruptions of the venenate malignitie diffuſed through it, by ſmels and perfumes reſiſting the poiſon thereof. The bodie will bee ſtrengthened and more powerfully reſiſt the infected Air, if it want excrementitious humors, which may bee procured by purgeing and bleeding; and for the reſt a convenient diet appointed, as ſhunning much varietie of meats, and hot and moiſt things, & all ſuch which are eaſily corrupted in the ſtomach, and cauſ obſtructions, ſuch as thoſe things which bee made by Comfit-makers; wee muſt ſhun ſatietie and drunkenneſs, for both of them weaken the powers, which are preſerved by the moderate uſe of meats of good juice.

Change of places the ſureſt prevention of the Plague.

Two things of chief account for prevention.

Diet for prevention of the Plague.

Let moderate excerciſes in a cleer Air, and free from anie venemous tainture, precede your meals.

Let the bellie have due evacuation either by Nature or Art.

Let the heart, the ſeat of life, and the reſt of the bowels bee ſtrengthened with Cordials and Antidotes applied and taken (as wee ſhall hereafter ſhew) in the form of epithemes, ointments, emplaſters, waters, pils, powders, tablets, opiates, fumigations, and ſuch like.

Make choice of a pure air, and free from all pollution, and far remote from ſtinking places, for ſuch is moſt fit to preſerv life, to recreate and repair the ſpirits; whereas on the contrarie, a cloudie or miſtie Air, and ſuch as is infected with groſs and ſtinking vapors, dull's the ſpirits, deject's the appetite, make's the bodie faint and ill colored, oppreſſeth the heart, and is the breeder of manie diſeaſes.

Diſcommodities of a cloudie or foggie Air.

The Northern winde is healthful, becauſ it is cold and drie. But on the contrarie, the Southern winde, becauſ it is hot and moiſt, weaken's the bodie by ſloth or dulneſs, open's the pores, and make's them pervious to the peſtiferous malignitie. The Weſtern winde is alſo unwholſom, becauſ it com's near to the nature of the Southern: wherefore the windows muſt bee ſhut up on that ſide of the houſ on which they blow, but opened on the North and Eaſt-ſide, unleſs it happen the Plague com from thence.

Why the South winde is peſtilent.

Kindle a clear fire in all the lodging Chambers of the houſ, and perfume the whole houſ with Aromatick things, as Frankincenſ, Myrrh, Benzoin, *Ladanum*, *Styrax*, Roſes, Mirtle-leavs, Lavander, Roſemarie, *Sage*, Savorie, wilde *Time*, Marjarum, Broom, Pine-apples, peeces of Firr, Juniper-berries, Cloves, Perfume's: and let your cloaths bee aired in the ſame.

The efficacie of fire againſt the Plague.

There bee ſom, who think it a great preſervative againſt the peſtilent Air, to keep a Goat in their houſes, becauſ the capacitie of the houſes, filled with the ſtrong *ſent* which the Goat ſend's forth, prohibit's the entrance of the venemous Air: which ſame reaſon hath place alſo in ſweet ſmels; and beſides it argue's, that ſuch as are hungrie are apter to take the Plague then thoſe who have eaten moderately: for the bodie is not onely ſtrengthened with meat, but all the paſſages thereof are filled by the vapors diffuſed from thence, by which otherwiſe the infected Air would finde a more eaſie entrance to the heart.

Moderate repletion good for prevention.

Yet the common ſort of people yeeld another reaſon for the Goat, which is, that one ill *ſent* drive's away another, as one wedg drive's forth another; which calleth to my minde that which is recorded by *Alexander Benedictus*, that there was a Scythian Phyſician, which cauſſed a Plague, ariſeing from the infection of the Air, to ceaſ, by cauſing all the dogs, cats, and ſuch like beaſts which were in the Cittie, to bee killed, and caſt their carcaſſes up and down the ſtreets, that ſo by the comming of this new putrid vapor as a ſtranger, the former peſtiferous

A ſtrange Art to drive away the Plague.

The antipathie of poisons with poisons.

pestiferous infection, as an old gueſt, was put out of its lodging, and ſo the Plague ceaſed. For poiſons have not onely an antipathie with their Antidotes, but alſo with ſom other poiſons.

Whil'ſt the Plague is hot, it is not good to ſtir out of door before the riſeing of the Sun: wherefore wee muſt have patience, until hee have cleanſed the Air with the comfortable light of his Beams, and diſperſed all the foggie and nocturnal pollutions, which commonly hang in the Air in dirtie, and eſpecially in low places and Vallies.

All publick and great meetings and aſſemblies muſt bee ſhunned.

Whether in the Plague-time one muſt travel by night or by daie.

If the Plague begin in Summer, and ſeem principally to rage, beeing helped forward by the Summers-heat, it is beſt to perform a journie begun, or undertaken for neceſſarie affairs, rather upon the night-time, then on the daie; becauſ the infection take's force, ſtrength and ſubtiltie of ſubſtance, by which it may more eaſily permeate and enter in by the heat of the Sun; but by night men's bodies are more ſtrong, and all things are more groſs and denſ. But you muſt obſerv a clean contrarie courſ, if the malignitie ſeem to borrow ſtrength and celeritie from coldneſs. But you muſt alwaies eſchew the beams of the Moon, but eſpecially at the *Full*: for then our bodies are more languid and weak, and fuller of excrementitious humors. Even as trees which for that cauſ muſt bee cut down in their ſeaſon of the Moon, that is, in the decreaſ thereof.

Why the Moon is to bee ſhunned.

After a little gentle walking in your Chamber, you muſt preſently uſe ſom means that the principal parts may bee ſtrengthned by ſuſcitateing the heat and ſpirits, and that the paſſages to them may bee filled, that ſo the waie may bee ſhut up from the infection comming from without. Such as by the uſe of garlick have not their heads troubled, nor their inward parts inflamed, as Countrie-People and ſuch as are uſed to it; to ſuch there can bee no more certain preſervative and antidote againſt the peſtiferous fogs or miſts, and the nocturnal obſcuritie, then to take it in the morning with a draught of good wine; for it beeing abundantly diffuſed preſently over all the bodie, fill's up the paſſages thereof, and ſtrengthneth it in a moment.

Garlick good againſt the Plague.

What water to be made choice of in the plague-time.

For water; if the Plague proceed from the tainture of the Air, wee muſt wholly ſhun and avoid Rain-water, becauſ it cannot but bee infected by the contagion of the Air. Wherefore the water of *Springs* and of the deepeſt Wells are thought beſt. But if the malignitie proceed from the vapors contained in the earth, you muſt make choice of Rain-water. Yet it is more ſafe to digeſt everie ſort of water by boiling it, and to prefer that water before other, which is pure and clear to the ſight, and without either taſte or ſmell, and which beſides ſuddenly take's the extremeſt mutation of heat and cold.

CHAP. VII.

Of the Cordial Remedies by which wee may preſerv our bodies in fear of the Plague, and cure thoſe already infected therewith.

Aqua theriacalis good againſt the Plague both inwardly taken and outwardly applied.

SUch as cannot eat without much labor, excerciſe and hunger, and who are no lovers of Break-faſts, haveing evacuated their excrements, before they go from home muſt ſtrengthen the heart with ſom Antidote againſt the virulencie of the infection. Amongſt which *Aqua Theriacalis*, or Treacle-water, two ounces, with the like quantitie of *Sack*, is much commended beeing drunk, and rubbing the noſtrils, mouth and ears with the ſame; for the Treacle-water ſtrengthen's the heart, expell's poiſon, and is not onely good for a preſervative, but alſo to cure the diſeaſ it ſelf: For by ſweat it drive's forth the poiſon contained within. It ſhould bee made in *June*, at which time all ſimple medicines, by the vital heat of the Sun, are in their greateſt efficacie.

The compoſition thereof

The compoſition whereof is thus: Take the roots of *Gentian*, *Ciperus*, Tormentil, Diptam, or *Fraxella*, Elecampane, of each one ounce; the leavs of Mullet, *Carduus Benedictus*, Divel's-bit, Burnet, Scabious, Sheeps-ſorrel, of each half a handful; of the tops of *Rue* a little quantitie; Mirtle-berries one ounce; of red Roſe-leavs, the flowers of Bugloſs, Borage and S. John's-wurt, of each one ounce: let them bee all cleanſed, dried and macerated for the ſpace of twentie-four hours in one pound of white wine or Malmſie, and of Roſe-water or Sorrel-water; then let them bee put in a veſſel of glaſs, and add thereto of Treacle and Mithridate, of each four ounces: then diſtill them in *Balneo Mariæ*, and let the diſtilled water bee received in a glaſs-Vial, and let there bee added thereto of Saffron two drams, of Bole-Armenick, *Terra ſigillata*, yellow Sanders, ſhaveings of Ivorie and Hartſ-horn, of each half an ounce; then let the glaſs bee well ſtopped, and ſet in the Sun for the ſpace of eight or ten daies. Let the preſcribed quantitie bee taken everie morning ſo oft as ſhall bee needful. It may bee given without hurt to ſucking children, & to women great with childe. But that it may be the more pleaſant, it muſt be ſtrain'd through an Hippocras-bag, adding thereto ſom ſuger & cinnamon.

Som think themſelvs ſufficiently defended with a root of Elecampane, Zedoarie, or Angelica, rowled in their mouth, or chawed between their teeth.

Others drink everie morning one dram of the root of *Gentian* bruiſed, beeing macerated for

for the ſpace of one night in two ounces of white wine.

Others take Worm-wood-wine.

Others ſup up in a rere egg one dram of *Terra Sigillata*, or of Hartſ-horn, with a little Saffron, and drink two ounces of wine after it.

There bee ſom that do infuſe Bole-Armenick, the roots of *Gentian*, Tormentil, Diptam, the berries of Juniper, Cloves, Mace, Cinnamon, Saffron, and ſuch like, in *aqua vitæ* and ſtrong white wine, and ſo diſtill it in *Balneo Mariæ*.

This Gordial water that followeth is of great vertue. Take of the roots of the long and round *Ariſtalochia*, Tormentil, Diptam, of each three drams, of Zedoarie two drams, *Lignum Aloës*, yellow Sanders, of each one dram, of the leavs of Scordium, St. John's-wurt, Sorrel, *Rue*, *Sage*, of each half an ounce, of *Bay* and Juniper-berries, of each three drams, Citron-ſeeds one dram, Cloves, *Mace*, Nutmegs, of each two drams, of Maſtich, *Olibanum*, Bole-Armenick, *Terra Sigillata*, ſhaveings of Hartſ-horn and Ivorie, of each one ounce, of Saffron one ſcruple, of the *Conſervs* of Roſes, Bugloſs-flowers, water-lillies and old Treacle, of each one ounce, of Camphire half a dram, of *aqua vitæ* half a pinte, of white wine two pintes and a half, make thereof a diſtillation in *Balneo Mariæ*, The uſe of this diſtilled water is even as Treacle water is. A Cordial water.

The Electuarie following is verie effectual. Take of the beſt Treacle three ounces, Juniper-berries and Carduus-ſeeds of each one dram and a half, of Bole-Armenick prepared half an ounce, of the power of the Electuarie *de Geminis* and *Diamargariton frigidum*, the powder of Hartſ-horn, and red Coral, of each one dram: mix them with the ſyrup of the rindes and juice of Pome-Citrons as much as ſhall ſuffice, and make thereof a liquid Electuarie in the form of an Opiate, let them take everie morning the quantitie of a Filberd, drinking after it two drams of the water of Scabious, Cherries, *Carduus Benedictus*, and of ſom ſuch like cordiall thing, or of ſtrong wine. A Cordial Electuarie.

The following Opiate is alſo verie profitable, which alſo may bee made into Tablets. Take of the roots of Angelica, *Gentian*, Zedoarie, Elecampane, of eath two drams; of Citron and Sorrel-ſeeds of each half a dram; of the dried rindes of Citrons, Cinnamon, Bay and Juniper-berrie, and Saffron, of each one ſcruple; of *conſerv* of Roſes and Bugloſs, of each one ounce; and fine hard Suger as much as is ſufficient: make thereof Tablets of the weight of half a dram, let him take one of them two hours before meat: or make thereof an Opiate with equal parts of *conſervs* of Bugloſs and *Mel Anthoſatum*, and ſo adding all the reſt drie and in powder. Or take of the roots of Valerian, Tormentil, Diptam, of the leavs of *Rue*, of each half an ounce; of Saffron, *Mace*, Nutmegs, of each half a dram; of Bole-Armenick prepared half an ounce; of *conſerv* of Roſes and ſyrup of Lemmons as much as will bee ſufficient to make thereof an Opiate liquid enough. Or take of the roots of both the *Ariſtolochia's*, of *Gentian*, Tormentil, Diptam, of each one dram and an half; of Ginger three drams; of the leavs of *Rue*, *Sage*, Mints and Pennie-royal, of each two drams; of *Bay* and Juniper-berries, Citron-ſeeds, of each four ſcruples; of *Mace*, Nutmegs, Cloves, Cinnamon, of each two drams; of *Lignum aloës*, and yellow Sanders, of each one dram; of Male-Frankincenſ, *i. Olibanum*, Maſtich, ſhaveings of Hartſ-horn and Ivorie, of each two ſcruple; of Saffron half a dram; of Bole-Armenick, *Terra Sigillata*, red Coral, Pearl, of each one dram; of *conſervs* of Roſes, Bugloſs-flowers, water-lillies and old Treacle, of each one ounce; of loaf-ſuger one pound and a quarter: a little before the end of the makeing it up, add two drams of *confectio Alkermes*, and of Camphire diſſolved in Roſe-water one ſcruple; make thereof an Opiate according to Art, the doſe thereof is from half a dram to half a ſcruple. An Opiate. Another. Another.

Treacle and Mithridate faithfully compounded, excell all Cordial medicines, adding for everie half ounce of them, one ounce and an half of *conſervs* of Roſes, or of Bugloſs, or of Violets, and three drams of Bole-Armenick prepared: Of theſe beeing mix't with ſtirring, and incorporated together, make a *conſerv*: It muſt bee taken in the morning the quantitie of a Filberd. You muſt chuſe that Treacle that is not leſs then four years old, nor above twelv: that which is ſomwhat new, is judged to bee moſt meet for cholerick perſons; but that which is old, for flegmatick and old men. For at the beginning the ſtrength of the *Opium* that enter's into the compoſition thereof, remain's in its full virtue for a year: but afterwards the more years old it waxeth, the ſtrength thereof is more aboliſhed, ſo that at length the whole compoſition becommeth verie hot.

The confection of *Alkermes* is verie effectual both for a preſervative againſt this diſeaſ, and alſo for the cure.

The quantitie of a Filberd of Rubarb, with one Clove chawed or rowled in the mouth, is ſuppoſed to repell the comming of the peſtilent Air: as alſo this compoſition following.

Take of preſerved Citron and Orange pils, of each one dram; of *conſerv* of Roſes, and of the roots of Bugloſs, of each three drams; of Citron-ſeeeds half an ounce; of Anniſ-ſeeds and Fennel-ſeeds, of each one dram; of Angelica-Roots four ſcruples; ſuger of Roſes as much as ſufficeth: Make a Confection, and cover it with leavs of Gold, and take a little of it upon a ſpoon before you go abroad everie morning. A Confection to bee taken in the morning againſt the peſtilent Air.

Or take of Pine-apple-kernels, and Fiſtick-nuts, infuſed for the ſpace of ſix hours in the water A March-pane

water of Scabious and Roſes, of each two ounces; of Almonds blanched in the fore-named waters half a pound: of preſerved Citron and Orange pills, of each one dram and an half: of Angelica-roots four ſcruples: make them according to art, unto the form of March-pane, or of anie other ſuch like confection, and hold a little piece thereof often in your mouth.

The Tablets following are moſt effectual in ſuch a caſe. Take of the roots of Diptam, Tormentil, Valerian, Elecampane, Eringoes, of each half a dram; of *Bole-Armenick*, *Terra Sigillata*, of each one ſcruple; of Camphir, Cinnamon, Sorrel-ſeeds, and Zedoarie, of each one ſcruple; of the *ſpecies* of the Electuarie *Diamargariton frigidum*, two ſcruples; of *conſerv* of Roſes, Bugloſs, preſerved-Citron-pills, Mithridate, Treacle, of each one dram; of fine Suger diſſolved in *Scabious* and *Carduus*-water, as much as ſhall ſuffice: Make thereof Tablets, of the weight of a dram, or half a dram: take them in the morning before you eat.

Pills of *Ruffus*. The pills of *Ruffus* are accounted moſt effectual preſervatives, ſo that *Ruffus* himſelf ſaith, that hee never knew anie to bee infected that uſed them: the compoſition of them is thus.

Take of the beſt Aloës half a dram, of Gum-*Ammoniacum* two drams, of Myrrh two drams and an half, of Maſtich two drams, of Safforn ſeven grains: put them all together, and incorporate them with the juice of Citrons, or the ſyrup of Limons, and make thereof a maſs, and let it bee kept in leather: Let the patient take the weight of half a dram everie morning two or three hours before meat, and let him drink the water of Sorrel after it, which through its tartneſs, and the thinneſs of its parts, doth infringe the force and power of the malignitie or putrefaction: For experience hath tanght us, that Sorrel beeing eaten or chawed in the mouth, doth make the pricking of Scorpions unhurtful. And for thoſe ingredients which do enter into the compoſition of thoſe pills, Aloës doth cleanſ and purge, Myrrh reſiſt's putrefaction, Maſtich ſtrengthen's, Saffron exhilarate's and make's livelie the ſpirits that govern the bodie, eſpecially the vital and animal.

Other pills. Thoſe pills that follow are alſo much approoved. Take of Aloës one ounce, of Myrrh half an ounce, of Saffron one ſcruple, of Agarick in Trochiſces two drams, of Rubarb in powder one dram, of Cinnamon two ſcruples, of Maſtich one dram and an half, of Citron-ſeeds twelve grains: powder them all as is requiſite; and make thereof a maſs with the ſyrup of Maiden-hair: let it bee uſed as aforeſaid.

If the maſs begin to wax hard, the pills that muſt preſently bee taken, muſt bee mollified with the ſyrup of Limons.

Other pills. Take of waſhed Aloës two ounces, of Saffron one dram, of Myrrh half an ounce, of *Ammoniacum* diſſolved in white wine one ounce, of honie of Roſes, Zedoarie, red Sanders, of each one dram, of *Bole-Armenick* prepared two drams, of red Coral half an ounce, of Camphir half a ſcruple: make thereof pills according to art. But thoſe that are ſubject or apt to the hemorrhoids ought not at all, or verie ſeldom to uſe thoſe kindes of pills that do receiv much Aloës.

They ſay, that King *Mithridates* affirmed by his own writeing, that whoſoever took the quantitie of an haſel-nut of the preſervative following, and drank a little wine after it, ſhould bee free from poiſon that day. Take two Wall-nuts, thoſe that be verie drie, two Figs, twentie leavs of *Rue*, and three grains of Salt: beat them, and incorporate them together, and let them bee uſed as is aforeſaid.

This remedie is alſo ſaid to bee profitable for thoſe that are bitten or ſtung by ſom venemous beaſt, and for this onely, becauſ it hath *Rue* in the compoſition thereof. But you muſt forbid women that are with childe the uſe of this medicine; for *Rue* is hot and drie in the third degree, and therefore it is ſaid to purge the womb, and provoke the flowers, whereby the nouriſhment is drawn away from the childe. Of ſuch varietie of medicines, every one may make choice of that that is moſt agreeable to his taſte, and as much thereof as ſhall bee ſufficient.

CHAP. VIII.

Of local medicines to bee applied outwardly.

THoſe medicines that have proper and excellent virtues againſt the peſtilence, are not to bee neglected to bee applied outwardly, or carried in the hand. And ſuch are all aromatical, aſtringent, or ſpirituous things, which therefore are endued with virtue to repel the venemous and peſtiferous air from comming and entring into the bodie, and to ſtrengthen the heart and the brain. Of this kinde are *Rue*, Balm, Roſemarie, *Scordium*, *Sage*, Worm-wood, Cloves, Nut-megs, Saffron, the roots of Angelica, and Lovage, and ſuch like, which muſt bee macerated one night in ſharp Vineger and *Aqua vitæ*, and then tied in a knot as big as an egg: or rather let it bee carried in a ſponge made wet, or ſoaked in the ſaid infuſion. For there is nothing that doth ſooner and better hold the ſpirituous virtue and ſtrength of aromatick things, then a ſponge. Wherefore it is of principal uſe either to keep or hold ſweet things to the noſe, or to applie Epithems and Fomentations to the heart.

Of what nature the medicines outwardly uſed ought to bee.

Thoſe

Thoſe ſweet things ought to bee hot or cold, as the ſeaſon of the year, and kinde of the peſtilence is As for example, in the Summer you ought to infuſe and macerate Cinnamon and Cloves, beaten together, with a little Saffron in equal parts, of vineger of Roſes, and Roſe-water, into which you muſt dip a ſponge, which rowled in a fair linnen cloth, you may carrie in your hand, and often ſmell to.

Take of Worm-wood half a handful; ten Cloves, of the roots of *Gentian* and Angelica, of each two drams; of vineger and Roſe-water, of each two ounces; of Treacle and Mithridate, of each one dram; beat and mix them all well together, and let a ſponge bee dipped therein, and uſed as above-ſaid. They may alſo bee encloſed in boxes made of ſweet wood, as of Juniper, Cedar, or Cypreſs, and ſo carried for the ſame purpoſe.

But there is nothing more eaſie to bee carried then Pomanders: the form of which is thus: Take of yellow Sanders, *Mace*, Citron-pills, Roſe and Mirtle-leavs, of each two drams; of Benzoin, *Ladanum*, *Storax*, of each half a dram; of Cinnamon and Saffron, of each two ſcruples; of Camphire and Amber-Greece, of each one ſcuple; of Musk three grains. Make thereof a Pomander, with Roſe-water, with the infuſion of Tragacanth. Or take red-Roſe-leavs, the flowers of Water-lillies and Violets, of each one ounce; of the three Sanders, Coriander-ſeeds, Citron-pills, of each half an ounce; of Camphire, one dram; let them all bee made into powder, and with Water of Roſes and Tragacanth make a pomander. Pomanders.

In the Winter it is to bee made thus. Take of *Storax*, Benzoin, of each one dram and a half; of Musk, half a ſcruple; of Cloves, Lavander and *Ciperus*, of each two drams; of the root of Orris, *i.e. Flower-de-Luce*, and *Calamus aromaticus*, of each two drams and a half; of Amber-Grece, three drams; of Gum-Tragacanth diſſolved in Roſe-water and *aqua vitæ*, as much as ſhall ſuffice: make thereof a Pomander.

And for the ſame purpoſe you may alſo uſe to carrie about with you ſweet powders, made of Amber-Greece, *Storax*, Orris, Nutmegs, Cinnamon, *Mace*, Cloves, Saffron, Benzoin, Musk, Camphire, Roſes, Violets, *Juncus odoratus*, Marjarum and ſuch like, of which beeing mixed together, Powders may may bee compounded and made. Sweet-powders.

Take of the roots of Orris two drams, of *Cyperus*, *Calamus aromaticus*, red Roſes, of each half an ounce; of Cloves half a dram, of *Storax*, one dram; of Musk, eight grains: mix them, and make a powder for a bag: or take the roots of Orris two ounces; red-Roſe-leavs, white Sanders, *Storax*, of each one dram; of *Cyperus*, one ounce; of *Calamus aromaticus*, one ounce; of Marjarum, half an ounce; of Cloves, three drams; of Lavander, half a dram; of Coriander-ſeeds, two drams; of good Musk, half a ſcruple; of *Ladanum* and Benzoin, of each a dram; of Nutmegs and Cinnamon, of each two drams: Make thereof a fine powder, and ſow it in a bag.

It will bee verie convenient alſo to applie to the *region* of the heart, a bag filled with yellow Sanders, *Mace*, Cloves, Cinnamon, Saffron and Treacle ſhaken together, and incorporated, and ſprinkled over with ſtrong vineger and Roſe-water in Summer, and with ſtrong wine and Muskadine in the Winter. Bags.

Theſe ſweet Aromatick things thar are ſo full of ſpirits, ſmelling ſweetly and ſtrongly, have admirable virtues to ſtrengthen the principal parts of the bodie, and to ſtir up the expulſive facultie to expel the poiſon.

Contrarie-wiſe, thoſe that are ſtinking and unſavorie, procure a deſire to vomit, & diſſolution of the powers, by which it is maniteſt how fooliſh and abſurd their perſwaſion is, that counſel ſuch as are in a peſtilent conſtitution of the Air, to receiv and take in the ſtinking and unſavorie vapors of *ſinks* and *privies*, and that eſpecially in the morning. Unſavorie things to bee eſchewed.

But it will not ſuffice to carrie thoſe preſervatives alone, without the uſe of anie other thing, but it will bee alſo verie profitable to waſh all the whole bodie in Vineger of the decoction of Juniper and Bay-berries, the Roots of *Gentian*, Marigolds, S. John's-Wurt, and ſuch like, with Treacle or Mithridate alſo diſſolved in it. For vineger is an enemie to all poiſons in general, whether they bee hot or cold: for it reſiſteth and hindereth putrefaction. Neither is it to bee feared, that it ſhould obſtruct the pores, by reaſon of its coldneſs, if the bodie bee bathed in it: for it is of ſubtil parts, and the ſpices boiled in it, have virtue to open.

Whoſoever accounteth it hurtful to waſh his whole bodie therewith, let him waſh onely his arm-holes, the *region* of his heart, his *temples*, groins, parts of generation; as haveing great and marvelous ſympathie with the principal and noble parts.

If anie miſſlike batheing, let him annoint himſelf with the following Unguent. Take oil of Roſes, four ounces; oil of Spike, two ounces; of the powder of Cinnamon and Cloves, of each, one ounce and a half; of Benzoin, half an ounce; of Musk, ſix grains; of Treacle, half a dram; of Venice-Turpentine, one dram and a half; of Wax, as much as ſhall ſuffice: make thereof a ſoft Unguent. An Unguent.

You may alſo drop a few drops of oil of Maſtich, of *Sage*, or of Gloves, and ſuch like, into the ears, with a little Civet or Musk.

CHAP.

CHAP. IX.

Of other things to bee observed for prevention, in fear of the Plague.

Why Venerie is to bee shunned.

VENERIE is chiefly to bee eschewed, for by it the powers are debilitated, the spirits dissipated, and the breathing places of the bodie diminished, and lastly, all the strength of nature weakned. A sedentarie life is to bee shunned, as also excess in diet, for hence proceed's obstruction, the corruption of the juices, and preparation of the bodie to putrefaction and the pestilence.

Women must bee verie careful that they have their courses duely, for stopping besides the custom, they easily acquire corruption, and draw by contagion the rest of the humors into their societie. Such as have fistulous, or otherwise old ulcers, must not heal them up in a

Running ulcers good in time of pestilence.

pestilent season; for it is then more convenient rather to make new ones and these in convenient and declineing places; that as by these channels, the sink of the humors of the bodie may bee emptied.

The Hemorhoids, bleedings, and other the like accustomed evacuations, must not bee stopped, unless they exceed measure. Moreover, they must at such times take heed that they touch or handle not anie of these things wherein the seeds or fuell of the pestilence may lie hid; such as are hemp, flax, quilts and coverings wherein such as have had the Plague have laid; skins and all lether-things, hangings and cloaths. You must dwell far from Church-

Places to bee shunned in time of plague.

yards, especially from those wherein the corps of such as have died of the Plague are not buried dead in the ground, as in the Church of *Innocents* in *Paris*, in which place by the same reason it sundrie times happen's that the bodies are plucked up, rent and torn by dogs. Also let them dwell far from places of execution, shambles of flesh and fish, from tan-houses, diars, tallow-chandlers, cloth-dressers, farriers, skinners, and from the places wherein metals are are cast or wrought. The filth and dung, especially of Swine, Privies, standing and muddie waters, and lastly all things of the like evil smell, must bee far remote from your habitation; the bellie must not bee emptied into those places, into which the excrements of such

What companie to bee avoided.

as have the plague are cast. The companie of such as usually visite those sick of the plague, must bee eschewed, as of Physicians, Apothecaries, Surgeons, Nurse-Keepers, Grave-makers and Bearers. For though they have not the Plague, yet comming out of a pestilent place, they may carrie with them lying in their garments, the seeds thereof. You may gather this by such have for a little while staied in a perfumer's shop, for the perfume diffused in the air, bestow's the smell upon the garments of such persons, so that gon from thence, such as meet them, will judg them to carrie perfumes with them. They shall also shun long watchings

You must do nothing in a pestilent season whereby you may grow too hot.

sound sleeping, all passions of the minde, especially anger, hunger, thirst, journying in the Sun, for that hath oftimes occasioned a diarie fever, which hath not seldom been seen to turn into a pestilent one; for by dilateing the pore of the skin, they have given entrance to the pestilent air, which by that means hath easily taken hold of the humor disposed to putrefaction.

CHAP. X.

Of the Office of Magistrates in the time of the Plague.

MAgistrates ought to have a special care that no filth bee heaped up, either in private or publick places: let all things bee kept neat in everie hous, and let all the streets bee kept clean, the dung and filth bee carried forth of the Cittie, as also the dead carcasses of killed dogs & cats, for becaus they oftimes lick and devour the excrements of such as have the Sickness, therefore they may by their familiar entrie into sound houses, there propagate the Plague. Wherefore they

Why dogs and cats must bee killed in a Plague-time.

must either bee drive'n forth of the Cittie, or killed, and so bee carried forth and buried deep in the ground. Wells, springs, and rivers themselvs, must bee free'd and cleansed from all impuritie. Care must bee had that mustie corn, tainted flesh, nor stinking fish bee not set to sale. Publick baths and hot-houses must bee prohibited, for that in these, men's bodies are

Why Baths and hot-houses are not then to bee allowed.

weakned, and made more yeelding and pervious to the pestiferous air. They shall commit the cure of such as have the Plague, to learned, skilful and honest Physicians and Apothecaries and Surgeons.

Such as are known to have the Plague, shall bee separated from such as are free there-from, and bee sent to such fit places as shall bee provided for them; for this is better and more humanely don then to shut up everie man in his own hous. They shall provide and fore-see that the household-stuff of such as have the Plague bee not set to sale. They shall set signs and noted marks upon the houses seazed upon by this disease, lest they should unawares run into danger. Wherefore to the same purpose they shall procure that the Surgeons and others that visit the sick of the Plague may bee known by som conspicuous mark, that such as pass by them may bee admonished of the danger; they shall also take care that the bodies of the

the dead bee buried as ſpeedily as may bee. For they ſooner and more grievouſly putrefie in a ſhort time, then the bodies of others of what death ſoever they die. Wherefore, neither birds, nor ravenous beaſts dare once touch their bodies, though unburied; for by taſteing them they ſhould quickly com to their deaths. The keepers of the gates of the Cittie ſhall bee admoniſhed, that they take ſpecial care that ſuch as are infected, or com from a viſited place, do not enter into the Cittie; for from one, the evil may com to ſpread it ſelf further; for one ſpark may ſet a whole Cittie on fire, and one ſcabbie ſheep infect a whole flock. And becauſ there is nothing which may more perfectly purge the air, and cleanſ it from all manner of noiſomneſs and infection, then fire; they ſhall command that there bee kindled, and perpetually kept burning-fires, made with odoriferous and ſtrong-ſmelling things, as Juniper, Turpentine, Broom, and the like.

Such as die of the Plague do quickly putrefie.

In ſtead hereof *Levinus* tell's, that the Souldiers of the Garriſon of Tornie uſed in a Plague-time to diſcharge their Canons laded onely with powder, turning their mouths upon the Cittie, and that morning and evening; that by the vehemencie of the mooved air, the peſtiferous fogs might bee chaſed away; and by the heat of the burned powder, the venenate and noiſom qualitie of the air might bee amended. Laſtly, I judg it fit to admoniſh Magiſtrates, that they have their eies and mindes attentive upon a murderous and impious kinde of Bearers and Nurſ-keepers; which allured with a deſire of gain (which whil'ſt the Plague reign's, they get abundantly) annoint the walls, doors, threſholds, knockers of gates and locks with the filth and ointments taken from ſuch as have the Plague, that the Plague within a while after ſeizing upon theſe alſo, the maſters of them flying away, and the familie diſperſed, they may there reign alone, and freely and without puniſhment carrie thence what they pleaſ; oftimes ſtrangling ſuch as lie readie to die, leſt recovering, they might bee their accuſers. This I remember happened at *Lions*, *Anno Dom.* 1565.

Lib.2.de occult. nat.mirac.

The villanie of ſom baſe people.

CHAP. XI.

What caution muſt bee uſed in chuſing Phyſicians, Apothecaries and Surgeons, who may have care of ſuch as are taken with the Plague.

IT is the part of Magiſtrates in the ſo great neceſſitie of the afflicted Commonwealth, to appoint learned, skilful, and honeſt Phyſicians, Surgeons, and Apothecaries, and ſuch as have more regard to the Law of God then to gain, to have the care and cure of ſuch as are viſited. But principally let them not take Surgeons and Apothecaries called by proclamation with ſound of trumpet, that if they will take this charge, they ſhall becom free without examination or reward. But let them rather bee allured by gifts and honeſt rewards, not onely then when as neceſſitie urgeth; but alſo after the Plague is over. For ſuch ſervant-Surgeons and Apothecaries as are called by proclamation, ſo to gain freedom, are moſt commonly unskilful and unexperienced Dunces; who, conſcious of their own ignorance, and fearing to undergo the examination of the Maſters of their Companies, refuſe no hazard, however dangerous, with deſire to obtain their freedom.

It is far worſ and more dangerous to fall into the hands of ſuch, then into the hands of theevs and murderers; for theſe, by providence or ſtrength, wee may chance to eſcape; but wee ſeek for and embrace the other, and haveing found them, lay our throats bare unto them, ſo by their unskilfulneſs to bee butchered. Certainly by the fault of the times, and the neglect of Magiſtrates, it is almoſt com to this paſs, that if anie honeſt and learned Phyſicians and Surgeons ſhall undertake this cure, they are commonly forced thereto by the Magiſtrate for fear of baniſhment or fineing. Therefore becauſ they do it againſt their wills, they ſhew themſelvs leſs vigilant, cheerful and painful about the ſick. They com unwillingly, and compelled hereto, becauſ by the memorie of the fore-paſt time, they ſufficiently know, how ſordid and baſely Magiſtrates, when the Plague hath been over-paſt, have been in paying the promiſed reward to men of their condition, who have ſtoutly run into danger; for thence it happen's, that dureing the reſt of their lives, they may ſit idle at home, for that they are infamous, and feared by the people onely for this, that a while agon they viſited ſuch as had the Plague. Therefore I would have Magiſtrates prudent, faithful, and free in chuſeing honeſt, learned and skilful men, who may undergo this ſo difficult and dangerous a charge.

CHAP. XII.

How ſuch as undertake the cure of the Plague ought to arm themſelvs.

FIrſt they muſt think and hold for certain, that they are not called to this office by men, but by God, ſo directing the counſels and actions of men as hee thinketh fit. Therefore they ſhall confidently enter into the cure thereof, for that our lot, life and death

Our lots are in the hands of the Lord.

are in the hands of the Lord: but notwithstanding they ought not to neglect remedies, which are given to men for prevention, lest by neglecting the gifts of God, they may seem to neglect him also that is the giver of so manie good and excellent benefits. Therefore first let them by purgeing and bleeding evacuate the humors subject to putrefaction, and to conceiv the seeds of the pestilence. Let them make two fontanella's by application of cauteries, to bee as rivelets to evacuate the excrementitious humors which are daily by little and little heaped up in us; let one of them bee in the right arm a little below the muscle *Epomis*, the other the space of three fingers under the knee on the in-side of the left leg. This is found by experience a verie certain means of prevention. Let them wash their whole bodies with the following lotion. Re. *aquæ rosacei rosati, aut sambucini, vini albi aut malvatici, an.* ℔vi. *rad. enulæ camp. angelicæ, gentian. bistortæ, zedoar. an.* ℥iii. *baccar. juniperi, & bederæ, an.* ℥ii. *salviæ, rorismar. absinth. rutæ, an.* m.i. *corticis citri,* ℥ß. *theriacæ & mithridat. an.* ℥i. *conquassanda conquassent, bulliant lento igni, & serventur ad usum antè commemoratum.* The epithems, unguents and bags formerly described shall bee applied to the region of the heart. I have read it noted by *John Baptist Theodosius*, that amongst other things, Arsenick may bee profitably applied to the region of the heart, that so it may by little and little accustom it self to poisons, that afterwards it may bee less harmed by their incursion, first makeing their assault upon it.

Where to make issues in the time of the Plague.

Cap. 8.

Epist. 2.

What to wear.

Let their garments bee made of Chamelet, Dutch-Sarge, Satin, Taffatie, or the like. Or elsif they cannot of these, let them bee of som other handsom Stuff, but not of Cloth, Freez, or the like, that they may take the venenate air, and carrie it with them to the infection of the sound. They shall oftimes change their cloaths, shirts and other linnen, and perfume them with aromatick things; let them warily approach to the sick, more warily speak unto him, with their faces looking away from him, rather then towards him, so that they may not receiv the breath of his mouth, neither the vapor nor smell of anie of his excrements.

How to visit your patients.

An historie.

When as I upon a time beeing called to visit one that lay sick of the Plague, came too near and heedlesly to him, and presently by sudden casting off the cloaths, laid him bare, that so I might the better view a *Bubo*, that hee had in his right groin, and two Carbuncles that were on his bellie, then presently a thick, filthie and putrid vapor arising from the broken abscess of the Carbuncle, as out of a raked puddle, ascended by my nostrils to my brain, whereupon I fainted, and fell down sensless upon the ground; raised up a little after, all things seemed to mee to run round; and I was readie to fall again, but that I staied my self by takeing hold of the bed-post. But one thing comforted mee, that there appeared no signs that my heart was affected, either by pain or panting, or the strong and contumacious failing of my powers. An argument that the animal spirits were onely dissipated by a venenate vapor, and that the substance of the heart was no way wronged, was a sneesing which took mee so violently, that I sneesed ten times, and then fell a bleeding at the nose; which excretion, I believ, free'd mee from all the impression of the malignitie. Let others, warned by this mine example, learn to bee wiser and more warie in this case, lest they com to a worse mishap then befel mee.

CHAP. XIII.

Of the signs of such as are infected with the Plague.

Whence certain signs of the Plague may bee taken.

WEe must not stay so long before wee pronounce one to have the Plague, until there bee pain and a tumor under his arm-holes, or in his groin, or spots (vulgarly called *Tokens*) appear over all the bodie, or carbuncles arise: for manie die through the venenate malignitie, before these signs appear. Wherefore the chiefest and truest signs of this disease are to bee taken from the heart, beeing the mansion of life, which chiefly and first of all is wont to bee assailed by the force of the poison. Therefore they that are infected with the Pestilence, are vexed with often swoundings and fainting; their pulse is feebler and slower then other, but somtimes more frequent, but that is specially in the night-season; they feel prickings over all their bodie, as if it were the pricking of needles; but their nostrils do itch especially by occasion of the malign vapors riseing upwards from the lower and inner, into the upper parts, their breast burneth, their heart beateth with pain under the left dug, difficultie of takeing breath, ptisick, cough, pain of the heart, and such an elation or puffing up of the *Hypocondria*, or sides of the bellie, distended with the abundance of vapors raised by the force of the feverish heat, that the patient will in a manner seem to have the Tympanie. They are molested with a desire to vomit, and oftentimes with much and painful vomiting, wherein green and black matter is seen, and alwaies of divers colors, answering in proportion to the excrements of the lower parts, the stomach beeing drawn into a consent with the heart, by reason of the vicinitie and communion of the vessels; oftentimes blood alone, and that pure, is excluded and cast up in vomiting; and is not onely cast up by vomiting out of the stomach, but also verie often out of the nostrils, fundament; and in women, out of the womb; the inward parts are often burned,

The cause of vomiting in such as have the plague.

burned, and the outward parts are ſtiff with cold, the whole heat of the patient beeing drawn violently inward, after the manner of a Cupping-glaſs, by the ſtrong burning of the inner parts; then the eie-lids wax blew, as it were through ſom contuſion, all the whole face hath an horrid aſpect, and as it were the color of lead, the eies are burning red, and as it were ſwoln, or puffed up with blood, or anie other humor, ſhed tears; and to conclude, the whole habit of the bodie is ſomwhat changed, and turned yellow. Their looks are ſuddenly changed.

Manie have a burning fever, which doth ſhew its ſelf by the patient's ulcerated jaws, unquenchable thirſt, drineſs and blackneſs of the tongue, and it cauſſeth ſuch a phrenſie by inflameing the brain, that the patients, running naked out of their beds, ſeek to throw themſelvs out of windows into the pits and rivers that are at hand. In ſom the joints of the bodie are ſo weakned, that they cannot go nor ſtand; from the beginning they are as it were buried in a long ſwound and deep ſleep, by reaſon that the fever ſendeth up to the brain the groſs vapors from the crude and cold humors, as it were from green wood newly kindled to make a fire. Why ſom that are taken with the plague are ſleepie.

Such ſleeping doth hold him eſpecially while the matter of the ſore or carbuncle is drawn together, and beginneth to com to ſuppuration. Oftentimes when they are awaked out of ſleep, there do ſpots and marks appear diſperſed over the skin, with a ſtinking ſweat. But if thoſe vapors bee ſharp that are ſtirred up unto the head, in ſtead of ſleep they cauſ great wakeing, and alwaies there is much diverſitie of accidents in the urine of thoſe that are infected with the Plague, by reaſon of the divers temperature and condition of bodies: neither is the urine at all times, and in all men of the ſame conſiſtence and color: For ſomtimes they are like unto the urine of thoſe that are ſound and in health, that is to ſay, laudable in color and ſubſtance; becauſ that when the heart is affected by the venemous air, that entreth in unto it, the ſpirits are more greatly grieved and moleſted then the humors: but thoſe, *i.e.* the ſpirits, are infected and corrupted when theſe do begin to corrupt. Why their urines are like thoſe that are ſound.

But Urines onely ſhew the diſpoſitions of the humors or parts in which they are made, collected together, and through which they paſs.

This reaſon ſeemeth truer to mee then theirs which ſay, that nature terrified with the malignities of the poiſon avoid's contention, and doth not reſiſt or labor to digeſt the matter that cauſſeth the diſeaſ.

Manie have their appetites ſo overthrown, that they can abſtain from meat for the ſpace of three daies together.

And to conclude, the varietie of accidents is almoſt infinite, which appear and ſpring up in this kinde of diſeaſ, by reaſon of the diverſitie of the poiſon, and condition of the bodies and grieved parts: but they do not all appear in each man; but ſom in one, and ſom in another.

CHAP. XIV.

What ſigns in the Plague are mortal.

IT is a moſt deadlie ſign in the Peſtilence, to have a continual and burning fever, to have the tongue drie, rough, and black, to breathe with difficultie, and to draw in a great quantitie of breath, but breathe out little; to talk idlely; to have phrenſie and madneſs together, with unquenchable thirſt and great watching; to have convulſions, the hicket, heart-beating, and to ſwound verie often and vehemently: further, toſſing and turning in the bed, with a loathing of meats, and dailie vomits of a green, black, and bloodie color; and the face pale, black, of an horrid and cruel aſpect, bedewed with a cold ſweat, and verie mortal ſigns.

There are ſom which at the verie beginning have ulcerous and painful wearineſs, pricking under the skin, with great torment of pain; the eies look cruelly and ſtareingly, the voice waxeth hoarſ, the tongue rough and ſtutting, and the underſtanding decaying; the patient uttereth and talketh of frivolous things. Truly thoſe are verie dangerouſly ſick, no otherwiſe then thoſe whoſe urine is pale, black, and troubled like unto the urine of carriage-beaſts, or lee, with divers colored clouds or contents; as blew, green, black, fattie and oilie, as alſo reſembling in ſhew a Spiders web, with a round bodie ſwimming on the top. An ulcerous and painful wearineſs from the beginning ſheweth the Plague to bee deadlie.

If the fleſh of the carbuncle bee drie and black, as it were ſeared with an hot iron, if the fleſh about it bee black and blew, if the matter do flow back, and turn in, if they have a laſk with greatly ſtinking, liquid, thin, clammie, black, green or blewiſh ordure; if they avoid worms, by reaſon of the great corruption of the humors, and yet for all this the patient is never the better; if the eies wax often dim, if the noſtrils bee contracted or drawn together, if they have a grievous cramp, the mouth bee drawn aſide, the muſcles of the face beeing drawn or contracted equally or unequally; if the nails bee black; if they bee often troubled with

with the Hicket, or have a Convulsion and resolution over all the bodie, then you may certainly prognosticate that death is at hand, and you may use cordial medicines onely, but it is too late to purge, or let blood.

CHAP. XV.

Signs of the Plague comming by contagion of the air without anie fault of the humors.

YOu shall understand, that the Pestilence proceed's from the corruption of the air, if it bee verie contagious, and disperseth it self into sundrie places in a moment. If it kill quickly and manie, so that whil'st sundrie persons go about their usual business, walk in the places of common resort, and through the streets, they suddenly fall down and die, no sign of the disease or harm appearing, nor anie pain oppressing them; for the malignitie of the corrupt air is quick and verie speedie in infecting our spirits, overthrowing the strength of the heart, and killing the patient. The patients are not troubled with great agitation, becaus the spirits dissipated by the rapid malignitie of the poison, cannot endure that labor; besides they are taken with frequent swoundings, few of them have Bubo's, few have Blains com forth; and by the same reason their urines are like to those of sound men.

Why they have no sores.

CHAP. XVI.

Signs of the Plague drawn into the bodie by the fault and putrefaction of humors.

FOrmerly wee have reckoned up the causses of the corruption of humors from plenitude, obstruction, distemper, and the ill juice of meats. Now must wee deliver the signs of each corrupt humor which reign's in us, that it may bee reduced to soundness and perfection of nature by the opposition of its contrarie, or elss bee evacuated by physick. Therefore if the bodie bee more yellow then usual, it is a sign of choler offending in quantitie and qualitie. If more black, then of melancholie; if more pale, then of phlegm; if more red, with the veins swoln up and full, then of blood. Also the color of the riseing blains, tumors and spots, expres's the color of the predominant humor, as also the excrements cast forth by vomit, stool and otherwise; the heavinesss and cheerfulness of the affected bodie; the manner of the present fever; the time of the year, age, region, diet. Such things as have a cutting, penetrateing, attenuateing, and cleaning facultie, take away obstruction. By means of obstruction fevers oftimes accompanie the Plague, and these not onely continual, but also intermitting, like tertians or quartanes. Therefore that Plague that is fixed in the infection or corruption of a cholerick humor, shew's it self by the fore-mentioned signs of predominateing choler, to wit, the heat of the skin, blains, and excrements, as also in the quickness of killing, and vehemencie of the symptoms, bitterness of the mouth, a painful and continual endeavour of going to stool, by reason of the acrimonie of choler stimulateing and rakeing the guts in the passage forth. That which reside's in the corrupt substance of gross humors, as of blood, sheweth it self by manie and plentiful sweats, by a scouring, by which are avoided manie and various humors; and oftimes also bloodie matter that proceed's from corrupt phlegm, it invade's with more sound sleep, and causseless wearinesss of all the members; when they are awakened out of their sleep, they are not seldom troubled with a trembling over all their joints, the entrance and way of the spirits into the members beeing obstructed by the grosness of the humors. That which is seated in the corruption of a melancholick humor, is accompanied with heavinesss and pain of the head, much pensiveness, a deep and small puls. But the most certain sign of the Plague resideing in the corruption of the humors, is to bee taken from the urine. For the signs of the vitiated humors cannot but shew themselvs in the urines: therefore troubled urines, and such as are like those of carriage-beasts, as also black and green, give certain notice thereof. But som are much troubled with thirst, others not at all; becaus choler or phlegm somtimes onely putrefie in the stomach or orifice of the ventricle; somtimes besides they will weaken the government of the natural faculties of the part, as of the appetite. But if the fever happen by the default and infection both of the air and humors; then will there bee a great confusion of the fore-mentioned signs and symptoms.

Signs of choler.

When the urine is to bee looked upon.

Why som are much troubled with thirst, others not at all.

CHAP.

CHAP. XVII.

Of the Prognoſtication that is to bee inſtituted in the Plague.

YOU may well fore-tell the future motions and events of diſeaſes, when you throughly know the nature of the diſeaſ, and accidents thereof, and the condition, function, and excellencie of the bodie and grieved parts: Although that this may bee ſpoken in general, That there is no certain prediction in peſtilent diſeaſes, either to health or death, for they have verie unconſtant motions, ſometimes ſwift and quick, ſomtimes ſlow, and ſomtimes choaking or ſuffocateing in a moment, while one breath's in the venemous air, as hee is going about anie of his neceſſarie affairs, haveing puſtles riſeing in the skin with ſharp pain, and as though the whole bodie were pricked all over with needles, or the ſtings of Bees. Which I have ſeen with mine eies in the Plague that was at *Lions* when *Charls* the French King lay there. It manie times commeth to paſs that the accidents that were verie vehement and rageing a little before, are ſuddenly aſſwaged, and the patients do think themſelvs better, or almoſt perfectly ſound. Which happen's to *Marie* one of the Queen-Mother her maids, in that notable peſtilent conſtitution of the Air, that year when *Charls* the French-King lay at the Caſtle of *Roſſilion*: For when ſhee was infected, a great tumor or *Bubo* aroſe in her groin, and ſuddenly it went in again, ſo that the third day of her ſickneſs, ſhee ſaid ſhee was without anie grief or diſeaſ at all, but that ſhee was troubled with the difficultie of makeing water; and I think it was becauſ the the bladder was enflamed by the refiux of the matter; but ſhee was found in minde and bodie, and walked up and down the chamber on the ſame day that ſhee died. The ſtrangeneſs of which thing made the King ſo fearful, that hee haſted to depart thence.

No certain prediction in the Plague.

An hiſtorie.

Although this diſeaſ doth ſpare no man of what age, temperature, complexion, diet and condition ſoever, yet it aſſaulteth young men that are cholerick and ſanguine, more often then old men that are cold and drie, in whom the moiſture that is the nouriſher of putrefaction by reaſon of their age is conſumed, and the waies, paſſages and pores of the skin, whereby the venemous air ſhould enter and pierce in, are more ſtrait and narrow. And moreover, becauſ old men do alwaies ſtay at home, but young men for their neceſſarie buſineſs, and alſo for their delight and pleaſure, are alwaies more abroad in the day-time, in the air, wherehence the pollution of the peſtilence commeth more often.

Why young men ſooner take the Plague then old.

That peſtilence that com's by the corruption of the humors, is not ſo contagious as that which commeth by the default of the air. But thoſe that are phlegmatick and melancholick, are moſt commonly grieved with that kinde of peſtilence; becauſ in them the humors are more clammie and groſs, and their bodies more cold and leſs perſpirable, for which cauſes the humors ſooner and more ſpeedily putrefie.

What Plague moſt contagious.

Men that are of an ill juice are alſo moſt apt to this kinde of peſtilence, for in the naughtie qualitie of the juice there is a great preparation of the humors unto putrefaction: You may know it by this, that when the peſtilence reigneth, there are no other diſeaſes among the common people, which have their original of anie ill juice, but they all degenerate into the Plague. Therefore when they begin to appear and wander up and down, it is a token that the peſtilence will ſhortly ceaſ, or is almoſt at an end.

But here alſo I would have you to unerſtand thoſe to bee of an ill juice, which have no pores in their skin, by which, as it were by rivers, the evil juice which is contrarie to nature, may bee evacuated and purged. And I have noted and obſerved, that thoſe are leſs in danger of the peſtilence which have cancerous ulcers and ſtinking ſores in their noſes, and ſuch as infected with the French Pocks, have by reaſon thereof, tumors and rotten ulcers, or have the King's-evil running upon them, the Leproſie or the Scab: and to conclude, all thoſe that have fiſtula's and running in their bodies.

Who leaſt ſubject to take the Plague.

I think thoſe that have quartane Fevers are the better priviledged for the ſame, becauſ that by the *Fit* cauſing ſweat, that commeth everie fourth daie, they avoid much of the evil juice that was engendred.

This is more like to bee true, then to think that the poiſon that commeth from without, may bee driv'n away by that which lurketh within.

Contrariwiſe, women that are great with childe, as I have noted, becauſ they have much ill juice, beeing prohibited from their accuſtomed evacuations, are verie apt to take this diſeaſ, and ſo ſeldom recover after the are infected.

Who ſubject thereto.

Black or blew impoſtumes, and ſpots and puſtles of the ſame color, diſperſed over the skin, argue that the diſeaſ is altogether incureable and mortal.

Signs the diſeaſ is incureable.

When the ſwelling or ſore goeth or commeth before the Fever, it is a good ſign; for it declareth that the malignitie is verie weak and feeble, and that nature hath overcom it, which of it ſelf is able to drive ſo great portion thereof from the inner parts. But if the ſore or tumor com after the Fever, it is a mortal and deadlie ſign, for it is certain that it commeth of the venemous matter not tranſlated, but diſperſed; not by the victorie of nature, but through the

A good ſign.

A deadlie ſign.

the multitude of the matter, with the weight whereof nature is overcom.

When the Moon decreaseth, those that are infected with the Pestilence are in great doubt and danger of death, becaus then the humors that were collected and gathered together before the Full of the Moon, through delay and abundance, do swell the more, and the faculties by which the bodie is governed, becom more weak and feeble, becaus of the imbecillitie of the native heat, which before was nourished and augmented by the light, and so consequently by the heat of the full-Moon: For as it is noted by *Aristotle*, the wainings of the Moon are more cold and weak: and thence it is that women have their menstrual fluxes chiefly or most commonly at that time.

In what air most contagious.

In a gross and cloudie Air the pestilent infection is less vehement and contagious then in a thin and subtil Air; whether that thinness of the Air proceed from the heat of the Sun, or from the North winde and cold. Therefore at *Paris*, where naturally; and also through the abundance of filth that is about the Citie, the Air is dark and gross, the pestilent infection is less fierce and contagious then it is in *Provinces*, for the subtiltie of the Air stimulates or helps forward the Plague.

But this diseas is mortal and pernicious whersoever it bee, becaus it suddenly assaulteth the heart, which is the Mansion, or as it were the fortress or castle of life: but commonly not before the signs and tokens of it appear on the bodie: and yet you shall scarce finde anie man that thinketh of calling the Physician to help to preserv him from so great danger before the signs thereof bee evident to bee seen and felt: but then the heart is assaulted: And when the heart is so assaulted, what hope of life is there, or health to bee looked for.

What effects ear and confidence produce in the Plague.

Therefore becaus medicines com' oft-times too late, and this maladie is as it were a sudden and winged messenger of our death, is commeth to pass that so manie die thereof. And moreover, becaus of the first suspicion of this so dire and cruel a diseas, the imagination and minde (whose force in the diversly much stirring up of the humors is great & almost incredible) is so troubled with fear of imminent death, and despair of health, that together with the perturbed humors, all the strength and power of nature falleth and sinketh down.

This you may perceiv and know, by reason that the keepers of such as are sick, and the bearers which are not fearfull, but verie confident, although they do all the baset offices which may bee for the sick, are commonly not infected, and seldom die thereof if infected.

CHAP. XVIII.

How a pestilent fever com's to bee bred in us.

THe Plague oft-times findeth fuel in our bodies, and oftimes allurements, to wit the putrefaction of humors, or aptnes to putrefie: but it never thence hath its first originall, for that com's alwaies from the defiled air; therefore a pestilent fever is thus bred in us: The pestilent Air drawn by inspiration into the lungs and transpiration into the utmost mouths of the veines and arteries spread over the skin, the blood or elf the humors alreadie putrefying or apt to putrefie therein, are infected and turned into a certain kinde of malignitie resembling the nature of the agent. These humors, like unquench't lime when it is first sprinkled with water, send forth a putrid vapor, which carried to the principal parts and heart especially, infecteth the spirituous blood boiling in the ventricles thereof, and therewith also the vital spirits; and hence proceed's a certain feverish heat. This heat diffused over the bodie by the arteries, together with a malign qualitie, taint's all, even the solid parts of the bones with the pestiferous venom; and besides, causseth divers symptoms, according to the nature thereof, and the condition of the bodie and the humors wherein it is. Then is the conflict of the malignitie assailing, and nature defending, manifest; in which if nature prevail, it, using the help of the expulsive faculties, will send and drive it far from the noble parts, either by sweats, vomits, bleeding, evacuation by stool or urine, buboes, carbuncles, pustles, spots, and other such kindes of breakings out over the skin. But on the contrarie, if the malignitie prevail, and nature bee too weak, and yeeld, and that first hee bee troubled with often panting or palpitation of the heart; then presently after with frequent faintings, the patient then at length will die. For this is a great sign of the Plague or a pestilent fever, if presently at the first, with no labor, nor anie evacuation worth the speaking of, their strength fail them, and they becom exceeding faint. You may finde the other signs mentioned in our preceding discours.

The original of the Plague alwaies from the Air.

Signs that nature is orecom.

CHAP.

CHAP. XIX.

Into what place the Patient ought to betake himſelf ſo ſoon as hee finde's himſelf infected.

WEe have ſaid that the perpetual and firſt original of the peſtilence commeth of the Air, therefore ſo ſoon as one is blaſted with the peſtiferous Air, after hee hath taken ſom preſervative againſt the malignitie thereof, hee muſt withdraw himſelf into ſom wholeſom Air, that is, clean and pure from any venemous infection or contagion; for there is great hope of health by the alteration of the Air; for wee do moſt frequently and abundantly draw in the Air of all things, ſo that wee cannot want it for a minute of time: therefore of the Air that is drawn in dependeth the correction, amendment, or increaſ of the poiſon or malignitie that is received, as the Air is pure, ſincere, or corrupted. Change of the Air conduceth to the cure of the Plague.

There bee ſom that do think it good to ſhut the patient in a cloſe chamber, ſhutting the windows to prohibit the entrance of the Air as much as they are able: But I think it more convenient that thoſe windows ſhould bee open from whence that winde bloweth that is directly contrarie unto that which brought in the venemous Air: For although there bee no other cauſ, yet if the Air bee not mooved, or agitated, but ſhut up in a cloſe place, it will ſoon bee corrupted. Therefore in a cloſe and quiet place that is not ſubject to the entrance of the Air, I would wiſh the Patient to make winde, or to procure Air with a thick and great cloth dipped or macerated in water and vineger mixed together, and tied to a long ſtaff, that by toſſing it up and down the cloſe chamber, the winde or air thereof may cool and recreate the Patient. The Patient muſt everie daie bee carried into a freſh chamber, and the beds and the linnen cloaths muſt bee changed: there muſt alwaies bee a clear and bright fire in the patient's chamber, and eſpecially in the night, whereby the air may bee made more pure, clean, and void of nightly vapors, and of the filthie and peſtilent breath proceeding from the Patient, or his excrements. In the mean time, leſt (if it bee in hot weather) the Patient ſhould bee weakned or made more faint by reaſon that the heat of the fire doth diſperſ and waſte his ſpirits, the *floor* or ground of his chamber muſt bee ſprinkled or watered with vineger and water, or ſtrowed with the branches of Vines made moiſt in cold water, with the leavs and flowers of Water-lillies, or Poplar, or ſuch like. In the fervent heat of Summer hee muſt abſtain from Fumigations that do ſmell too ſtrongly, becauſ that by aſſaulting the head, they increaſ the pain. Air pen't up is apt to putrefie.

If the Patient could to that coſt, it were good to hang all the chamber where hee lieth, and alſo the bed, with thick or courſ linnen cloaths moiſtned in vineger and water of Roſes. Thoſe linnen cloaths ought not to bee verie white, but ſomwhat brown, becauſ much and great whiteneſs doth diſperſ the ſight, and by walteing the ſpirits, doth increaſ the pain of the head: for which cauſ alſo the chamber ought not to bee verie lightſom.

Contrariwiſe, on the night ſeaſon there ought to bee fires and perfumes made, which by their moderate light, may moderately call forth the ſpirits.

Sweet fires may bee made of little peeces of the wood of Juniper, Broom, Aſh, Tamarisk, of the rinde of Oranges, Limmons, Cloves. Benzoin, gum-Arabick, Orris-roots, Myrrh, groſly beaten together, and laid on the burning coals put into a chafing-diſh. Truly the breath or ſmoak of the wood or berries of Juniper, is thought to drive ſerpents a great waie from the place where it is burn't. The virtue of the Aſh-tree againſt venom is ſo great, as *Plinie* teſtifieth, that a ſerpent will not com under the ſhadow thereof, no, not in the morning, nor evening, when the ſhadow of anie thing is moſt great and long, but hee will run from it. I my ſelf have prooved that if a circle or compaſs bee made with the boughs of an Aſh-tree, and a fire made in the mid'ſt thereof, and a ſerpent put within the compaſs of the boughs, that the ſerpent will rather run into the fire then through the Aſh-boughs. The materials for ſweet fires. *Lib. 16. cap. 13.*

There is alſo another means to correct the Air. You may ſprinkle vineger of the decoction of *Rue*, *Sage*, Roſemarie, Bay-berries, Juniper-berries, *Ciperus*-nuts, and ſuch like, on ſtones or bricks red hot, and put in a pot or pan, that all the whole chamber where the patient lieth may bee perfumed with the vapor thereof.

Alſo Fumigations may bee made of ſom matter that is more groſs and clammie, that by the force of the fire the fume may continue the longer, as of *Ladanum*, Myrrh, Maſtich, Roſin, Turpentine, *Storax*, *Olibanum*, Benzoin, Bay-berries, Juniper-berries, Cloves, *Sage*, Roſemarie, and Marjanum, ſtamped together, and ſuch like. Perfumes.

Thoſe that are rich and wealthie may have Candles and Fumes made of wax, or Tallow mixed with ſom ſweet things. Sweet candles.

A ſponge macerated in vineger of Roſes, and Water of the ſame, and a little of the decoction of Cloves, and of Camphire added thereto, ought alwaies to bee readie at the patient's hand, that by often ſmelling unto it, the animal-ſpirits may bee recreated and ſtrengthned.

The water following is verie effectual for this matter. Take of Orris four ounces; of Zedoarie, Spikenard, of each ſix drams; of *Storax*, Benzoin, Cinnamon, Nutmegs, Cloves, A ſweet water to ſmell to.

of

of each one ounce and a half; of old Treacle, half an ounce: bruiſ them into groſs powder, and macerate them for the ſpace of twelv hours in four pound of white and ſtrong wine; then diſtill them in a Limbeck of glaſs on hot aſhes, and in that liquor wet a ſponge, and then let it bee tied in a linnen cloth, or cloſed in a box, and ſo often put into the noſtrils. Or take of the vineger and water of Roſes, of each four ounces; of Camphire, ſix grains; of Treacle, half a dram: let them bee diſſolved together, and put into a vial of glaſs, which the patient may often put into his noſe.

A *Nodula* to ſmell to.

This *Nodula* following is more meet for this matter. Take of Roſe-leavs, two pugils; of Orris, half an ounce; of *Calamus aromaticus*, Cinnamon, Cloves, of each two drams; of Storax and Benzoin, of each one dram and a half; of *Cyperus*, half a dram; beat them into a groſs powder, make thereof a *Nodula* between two peeces of Cambrick or Lawn of the bigneſs of an hand-ball, then let it bee moiſtned in eight ounces of Roſe-water, and two ounces of Roſe-vineger, and let the patient ſmell to it often. Thoſe things muſt bee varied accordeng to the time: For in the Summer you muſt uſe neither Muſk nor Civet, nor ſuch like hot things: and moreover women that are ſubject to *fits* of the *Mother*, and thoſe that have Fevers or the head-ach, ought not to uſe thoſe things that are ſo ſtrong ſmelling and hot, but you muſt make choice of things more gentle: Therefore things that are made with a little Camphire and Cloves bruiſed and macerated together in Roſe-water and vineger of Roſes, ſhall bee ſufficient.

CHAP. XX.

What Diet ought to bee obſerved, and firſt of the choice of Meat.

THe order of Diet in a peſtilent diſeaſ ought to bee cooling and drying; not ſlender, but ſomwhat full; Becauſ by this kinde of diſeaſ there commeth waſteing of the ſpirits, and exſolution of the faculties, which inferreth often ſwounding, therefore that loſs muſt bee repaired as ſoon as may bee with more quantitie of meats that are of eaſie concoction and digeſtion. Therefore I never ſaw anie bee-

Why ſuch as have the plague may feed more fully.

ing infected with the peſtilence that kept a ſlender diet, that recovered his health, but died; and few that had a good ſtomach, and fed well, died.

Sweet, groſs, moiſt and clammie meats, and thoſe which are altogether, and exquiſitely of ſubtil parts, are to bee avoided; for the ſweet do eaſily take fire, and are ſoon inflamed; the moiſt will putrefie; the groſs and clammie obſtruct, and therefore engender putrefaction; thoſe meats that are ſubtil parts, over-much attenuate the humors, and inflame them; and do ſtir up hot and ſharp vapors into the brain, whereof commeth a Fever. Therefore wee muſt eſchew Garlick and Onions, Muſtard, ſalted and ſpiced Meats, and all kinde of Pulſ muſt alſo bee avoided, becauſ they engender groſs windes, which are the autors of obſtruction: but the decoction of them is not alwaies to bee refuſed, becauſ it a provoker of urine.

Pulſ muſt bee ſhunned.

The manner of Diet.

Therefore let this bee their order of diet: let their bread bee of Wheat or Barlie, well wrought, well leavened and ſalted, neither too new, nor too ſtale: let them bee fed with ſuch meat as may bee eaſily concocted and digeſted, and may engender much laudable juice, and verie little excremental, as are the fleſh of Wether-Lambs, Kids, Leverets, Pullets, Partridges, Pigeons, Thruſhes, Larks, Quails, Black-Birds, Turtle-Doves, Moor-Hens, Pheſants, and ſuch like; avoiding water-Fowls. Let the fleſh bee moiſtned in Ver-juice of unripe Grapes, Vineger, or the juice of Limmons, Oranges, Citrons, tart-Pomgranats, Barberries, Gooſ-berries, or red Currance, or of garden and wilde-ſorrel: for all theſe ſowr things are verie wholſom in this kinde of diſeaſ, for they do ſtir up the appetite, reſiſt the venemous qualitie and putrefaction of the humors, reſtrain the heat of the Fever, and prohibit the corruption of the meats in the ſtomach. Although that thoſe that have a more weak ſtomach, and are endued with a more exact ſenſ, and are ſubject to the Cough and diſeaſes of the Lungs, muſt not uſe theſe, unleſs they bee mixed with Sugar and Cinnamon.

If the patient at anie time bee fed with ſodden meats, let the brothes bee made with Lettuce, Purſlain, Succorie, Borage, Sorrel, Hops, Bugloſs: Creſſes, Burnet, Marigolds, Chervil, the cooling Seeds, French-Barlie and Oat-meal, with a little Saffron, for Saffron doth engender manie ſpirits, and reſiſteth poiſon. To theſe opening roots may bee added to avoid obſtruction; yet much broth muſt bee refuſed by reaſon of moiſture. The fruit of Capers eaten at the beginning of the Meal provoke the appetite; and prohibit obſtructions; but they ought not to bee ſeaſoned with over-much oil and ſalt, that they may alſo with good ſucceſs bee put into broths.

Fiſhes are altogether to bee avoided, becauſ they ſoon corrupt in the Stomach: but if the patient bee delighted with them, thoſe that live in ſtonie places muſt bee choſen; that is to ſay, thoſe that live in pure and ſandie water, and about rocks and ſtones, as are Trouts, Pikes, Pearches, Gudgeons and Creviſes boiled in milk, Wilks, and ſuch like. And concerning Seafiſh, he may bee fed with Giltheads, Gurnarts, with all the kindes of Cod-fiſh, Whiteings not ſeaſoned with ſalt, and Turbuts.

Eggs

Eggs potched and eaten with the juice of Sorrel, are verie good. Likewiſe Barlie-water ſeaſoned with the grains of a tart Pomgranat, and if the Fever bee vehement, with the ſeeds of white Poppie. Such barlie-water is eaſie to bee concocted and digeſted, it cleanſeth greatly, and moiſten's and mollifieth the bellie. But in ſom it procure's an appetite to vomit, and pain of the head, and thoſe muſt abſtain from it. But in ſtead of Barlie-water they may uſe pap, and bread crummed in the decoction of a Capon.

For the ſecond courſ, let him have raiſins of the Sun newly ſodden in Roſe-water with Sugar, ſowr Damask-Prunes, tart Cherries, Pippins and Katharine-Pears: For the ſecond courſ.

And in the later end of the *Meal*, Quinces roſted in the embers, Marmalate of Quinces, and *conſervs* of Bugloſs or of Roſes, and ſuch like, may bee taken: or elſ this powder following. In the end of the *Meal*.

Take of Coriander-ſeeds prepared, two drams: of Pearl, Roſe-leavs, ſhaveings of Hartſhorn and Ivorie, of each half a dram; of Amber, two ſcruples; of Cinnamon one ſcruple; of Unicorn's horn, and the bone in a Stagg's heart, of each half a ſcruple; of Sugar of Roſes, four ounces: make thereof a powder, and uſe it after meats.

If the patient bee ſomwhat weak, hee muſt bee fed with Gellie made of the fleſh of a Capon, and Veal ſodden together in the water of Sorrel, *Carduus Benedictus*, with a little quan of Roſe-vineger, Cinnamon, Sugar, and other ſuch like, as the preſent neceſſitie ſhall ſeem to require.

In the night ſeaſon for all events and miſchances, the patient muſt have readie-prepared broth of meats of good digeſtion, with a little of the juice of Citrons or Pomgranats.

This reſtaurative that followeth may ſerv for all. Take of the *conſerv* of Bugloſs, Borage, Violets, Water-lillie, and Succorie, of each two ounces; of the powder of the Electuarie *Diamargaritum frigidum*, of the Trochiſces of Camphir, of each three drams; of Citron-ſeeds, *Carduus*-ſeeds, Sorrel-ſeeds, the roots of *Dictamnus*, Tormentil,, of each two drams; of the broth of a young Capon, made with Lettuce, Purſlain, Bugloſs and Borage boiled in it, ſix pintes; put them in a Limbeck of glaſs with the fleſh of two Pullets, of ſo manie Partridges, and with fifteen leavs of pure Gold: make thereof a diſtillation over a ſoft fire. Then take of the diſtilled liquor, half a pinte, ſtrain it through a woollen bag, with two ounces of white Sugar, and half a dram of Cinnamon: Let the patient uſe this when hee is thirſtie. Or elſ put the fleſh of one old Capon, and of a leg of Veal, two minced Partridges, and two drams of whole Cinnamon without anie liquor, in a Limbeck of glaſs, well luted and covered, and ſo let them boil in *Balneo Mariæ* unto the perfect concoction. For ſo the fleſhes will bee boiled in their own juice, without anie hurt of the fire; then let the juice bee preſſed out there-hence with a Preſs: give the patient for everie doſe, one ounce of the juice with ſom cordial waters, ſom *Triſantalum*, and *Diamargaritum frigidum*. A reſtaurative drink.

The *preſervs* of ſweet fruits are to bee avoided, becauſ that ſweet things turn into choler but the confection of tart prunes, Cherries, and ſuch like may bee fitly uſed. But becauſ there is no kinde of ſickneſs that ſo weaken's the ſtrength, as the plague; it is alwaies neceſſarie, but yet ſparingly and often, to feed the patient, ſtill haveing reſpect unto his cuſtom, age, the region, and the time: for through emptineſs there is great danger, leſt that the venemous matter that is driv'n out to the ſuperficiall parts of the bodie, ſhould bee called back into the inward parts, by an hungrie ſtomach, and the ſtomach it ſelf ſhould be filled with cholerick, hot, thin, and ſharp excremental humors, whereof commeth biteing of the ſtomach, and gripeings in the guts.

CHAP. VII.

What drink the patient infected ought to uſe.

IF the fever bee great and burning, the patient muſt abſtain from wine, unleſs that hee bee ſubject to ſwounding: and hee may drink the *Oxymel* following in ſtead thereof.

Take of fair water, three quarts; wherein boil four ounces, of honie untill the third part bee conſumed, ſcumming it continually; then ſtrain it, and put it into a clean veſſel, and add thereto four ounces of vineger, and as much cinnamon as will ſuffice to give it a taſt. Or elſ a ſugred water, as followeth. Take two quarts of fair water; of hard ſugar, ſix ounces; of cinnamon, two ounces; ſtrain it through a woollen bag or cloth without anie boiling; and when the patient will uſe it, put thereto a little of the juice of Citrons. The ſyrup of the juice of Citrons excelleth amongſt all others that are uſed againſt the peſtilence. An *Oxymel*.

The uſe of the Julip following is alſo verie wholſom. Take of the juice of Sorrel well clarified, half a pinte; of the juice of Lettuce ſo clarified, four ounces; of the beſt hard ſugar, one pound; boil them together to a perfection; then let them be ſtrained & clarified, adding a little before the end a little vineger, and ſo let it be uſed between meals with boiled water, or with equal portions of the water of Sorrel, Lettuce, Scabious and Bugloſs: or take of this A Julip.

former

mer described Julip strained and clarified four ounces; let it bee mixed with one pound of the fore-named cordial waters, and boil them together a little. And when they are taken from the fire, put thereto of yellow Sanders one dram; of beaten Cinnamon half a dram; strain it through a cloth: when it is cold, let it bee given the patient to drink with the juice of Citrons.

Those that have been accustomed to drink sider, perrie, beer or ale, ought to use that drink still, so that it it bee clear, transparent, and thin, and made of those fruits that are somwhat tart; for troubled and dreggish drink doth not onely engender gross humors, but also crudities, windiness, and obstructions of the first *region* of the bodie, whereof com's a fever.

The commodities of oxycrate.

Oxycrate beeing given in manner following, doth asswage the heat of the fever, and repress the putrefaction of the humors, and the fierceness of the venom, and also expelleth the water through the veins, if so bee that the patients are not troubled with spitting of blood, cough, yexing, and altogether weak of stomach: for such must avoid tart things.

To whom hurtfull.

Take of fair water, one quart; of white or red vineger three ounces; of fine sugar, four ounces; of syrup of Roses, two ounces: boil them a little, and then give the patient thereof to drink. Or take of the juice of Limons and Citrons, of each half an ounce; of the juice of sowr Pomgranats, two ounces; of the water of Sorrel and Roses, of each an ounce; of fair water boiled, as much as shall suffice: make thereof a Julip, and use it between meals. Or take the syrup of Limmons and of red currance, of each one ounce; of the water of lillies, four ounces; of fair water boiled, half a pinte; make thereof a Julip. Or take of the syrups of water-Lillies and vineger, of each half and ounce; dissolv it in five ounces of the water of Sorrel; of fair water one pinte: make thereof a Julip.

The drinking of cold water to whom and when profitable.

But if the patient bee young, and have a strong and good stomach, and cholerick by nature, I think it not unmeet for him to drink a full & large draught of fountain-water cold; for that is effectual to restrain and quench the heat of the Fever; and contrariwise, they that drink cold water often, and a verie small quantitie at a time, as the Smith doth sprinkle water on the fire at his Forge, do increas the heat and burning, and thereby make it endure the longer. Therefore by the judgment of *Celsus*, when the disease is in the chief increas, and the patient hath endured thirst for the space of three or four daies, cold water must bee given unto him in great quantitie, so that hee may drink past his satietie, that when his bellie and stomach are filled beyond measure, and sufficiently cooled, hee may vomit.

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Som do not drink so much thereof as may caus them to vomit, but do drink even unto satietie, and so use it for a cooling medicine; but when either of these is don, the patient must bee covered with manie cloaths, and so placed that hee may sleep; and for the most part after long thirst and watching, and after long sulness, and long, and great heat, sound sleep commeth; by which great sweat is sent out, and that is a present help.

But thirst must somtimes bee quenched with little pieces of Melons, Gourds, Cucumbers, with the leav's of Lettuce, Sorrel, and Purslain, made moist or soaked in cold water, or with a little square piece of a Citron, Limmon, or Orange macerated in Rose-water, and sprinkled with Sugar, and so held in the mouth, and then changed.

But if the patient bee aged, his strength weak, flegmatick by nature, and giv'n to wine, when the state of the Fever is somwhat past, and the chief heat beginning to asswage, hee may drink wine verie much allayed at his meat; for to restore his strength, and to supplie the want of the wasted spirits. The patient ought not by anie means to suffer great thirst, but must mitigate it by drinking, or elf allay it by washing his mouth with oxycrate and such like; and hee may therein also wash his hands and his face, for that doth recreate the strength. If the flux or lask trouble him, hee may verie well use to drink steeled water, and also boiled milk, wherein manie stones comming red hot out of the fire have been manie times quenched. For the drineſs and roughness of the mouth, it is verie good to have a cooling, moistening & lenifying lotion of the mucilaginous water of the infusion of the seeds of Quinces, *psilium, id est*, Flea-wurt, adding thereto a little Camphir, with the Water of Plantain and Roses; then cleans and wipe out the filth, and then moisten the mouth, by holding therein a little oil of sweat Almonds mixed with a little syrup of Violets. If the roughness breed or degenerate into ulcers, they must bee touched with the water of the infusion of *sublimate*, or *Aqua fortis*.

For drieness or roughness of the mouth.

For the Ulcers thereof.

But becaus wee have formerly made frequent mention of drinking of water, I have here thought good to speak somwhat of the choice and goodness of waters. The choice of waters is not to bee neglected, becaus a great part of our diet depend's thereon; for besides that wee use it either alone, or mixed with wine for drink, wee also knead bread, boil meat, and make broths therewith. Manie think that rain-water which falls in summer, and is kept in a cistern well placed and made, is the wholesomest of all. Then next thereto they judge that spring water which run's out of the tops of mountains, through rocks, cliffs & stones: in the third place they put Well-water, or that which riseth from the foots of hils. Also the river-water is good that is taken out of the mid'st or stream. Lake or pond-water is the worst, especially if it stand still for such is fruitfull of and stored with manie venemous creatures, as Snakes, Toads, and the like. That which com's by the melting

The choice of waters.

melting of Snow and Ice is verie ill, by reason of the too refrigerateing faculties and earthlie nature. But of spring and Well-waters these are to bee judged the best, which are insipid, without smell, and colour; such as are clear, warmish in winter, and cold in summer, which are quickly hot, and quickly cold, that is, which are most light, in which all manner of puls, turnips, and the like, are easily and quickly boiled. Lastly, when as such as usually drink thereof, have clear voices and shrill, their chests sound, and a livelie and fresh colour in their faces. *Hip. sect. 5. aphor. 26.*

CHAP. XXII.

Of Antidotes to bee used in the Plague.

NOw wee must treat of the proper cure of this disease, which must bee used as soon as may bee possible, becaus this kinde of poison in swiftness exceedeth the celeritie of the medicine. Therefore it is better to err in this, that you should think everie disease to bee pestilent in a pestilent season, and to cure it as the Pestilence: becaus that so long as the air is polluted with the seeds of the Pestilence, the humors in the bodie are soon infected with the vicinitie of such an air, so that then there happeneth no disease void of the Pestilence, that is to say, which is not pestilent from the beginning by his own nature, or which is not made pestilent.

The beginning of the cure must bee by Antidotes.

Manie begin the cure with blood-letting, som with purgeing; and som with Antidotes. Wee, takeing a consideration of the substance of that part that is assaulted, first of all begin the cure with an Antidote; becaus that by its specifick propertie, it defends the heart from poison, as much as it is offended therewith. Although there are also other Antidotes which preserv and keep the heart and the patient from the danger of Poison and the Pestilence, not onely becaus they do infringe the power of the poison in their whole substance, but also becaus they drive and expel it out of all the bodie by sweat, vomiting, scouring, and such other kindes of evacuations.

In what quantitie they must bee taken.

The Antidote must bee give'n in such a quantitie as may bee sufficient to overcom the poison; but becaus it is not good to use it in greater quantitie then needeth, lest it should overthrow our nature, for whose preservation onely it is used; therefore that which cannot bee taken together at once, must bee taken at several times, that som portion thereof may daily bee used so long, untill all the accidents, effects and impressions of the poison bee past; and that there bee nothing to bee feared. Som of those Antidotes consist of portions of venemous things, beeing tempered together, and mixed in an apt proportion with other medicines, whose power is contrarie to the venom: as Treacle, which hath for an ingredient the flesh of Vipers, that it beeing thereto mixed may serv as a guide to bring all the Antidote unto the place where the venenate malignitie hath made the chief impression; becaus by the similitude of nature and sympathie, one poison is suddenly snatched and carried into another. There are other absolutely poisonous; which nevertheless are Antidotes one unto another: as a Scorpion himself cureth the pricks of a Scorpion. But Treacle and Mithridate excel all other Antidotes: for by strengthening the noblest part, and the mansion of life, they repair and recreate the wasted Spirits, and overcom the poison, not onely beeing taken inwardly, but also applied outwardly to the *region* of the heart, Botches and Carbuncles: for by an hidden propertie they draw the poisons unto them, as Amber doth Chaff, and digest it when it is drawn, and spoil and rob it of all its deadlie force; as it is declared at large by *Galen*, in his book *de Theriacâ ad Pisonem*, by most true reasons and experiments. But you will say that these things are hot, and that the plague is often accompanied with a burning fever. But thereto I answer, there is not so great danger in the fever, as in the pestilence, although in the giveing of Treacle, I would not altogether seem to neglect the fever, but think it good to minister or applie it mixed with cordial-cooling medicines, as with the Trochisces of Camphir, syrup of Limmons, of water-Lillies, the water of Sorrel, and such like. And for the same cause wee ought not to chuse old Treacle, but that which is of a middle age, as of one or two years old: to those that are strong, you may give half a dram; and to those that are more weak, a dram.

Why poisonous things are put into Antidotes.

Som poisons Antidotes to other-som.

How to walk after the takeing of an Antidote.

The patient ought to walk presently after hee hath taken Treacle, Mithridate, or anie other Antidote; but yet as moderately as hee can: not like unto manie, which when they perceiv themselvs to bee infected, do not ceas to cours and run up and down, until they have no strength to sustain their bodies; for so they dissolv nature, so that it cannot suffice to overcom the contagion. After moderate walking, the patient must bee put warm to bed, and covered with manie cloaths, and warm brick-bats or tiles applied to the soles of his feet; or in stead thereof you may use swines bladders filled with hot water, and applie them to the groins and arm-holes, to provoke sweat: for sweating in this disease is a most excellent remedie, both for to evacuate the humors in the fever, and also to drive forth the malignitie in the pestilence, although everie sweat bring's not forth the fruit of health. For *George Agricola*

Agricola ſaith, that hee ſaw a woman at *Miſnia* in Germanie, that did ſweat ſo for the ſpace of three daies, that the blood came forth at her head and breaſt, and yet nevertheleſs ſhee died.

A ſudoriferck potion.

This potion following will provoke ſweat. Take the roots of China ſhaved in thin pieces one ounce and half; of *Guaicum* two ounces; of the bark of Tamarisk one ounce; of Angelica-roots two drams; of the ſhavings of Hartſ-horn one ounce; of Juniper-berries three drams; put them into a vial of glaſs that will contain ſix quarts, put thereto four quarts of running or river-water that is pure and clear, macerate them for the ſpace of one whole night on the aſhes: and in the morning boil them all in *Balneo Mariæ*, untill the half bee conſumed, which will bee don in the ſpace of ſix hours; then let them bee ſtrained through a bag, and then ſtrained again, but let that bee with ſix ounces of ſugar of Roſes, and a little Treacle: let the patient take eight ounces or fewer of that liquor, and it will provoke ſweat.

A ſuderifick powder.

The powder following is alſo verie profitable. Take of the leav's of *Dictamnus*, the roots of Tormentil, Betonie, of each half an ounce; of Bole-Armenick prepared one ounce; of *Terræ Sigillata* three drams; of Aloës and Myrrh, of each half a dram; of Saffron one dram; of Maſtich two drams: powder them all according to art, and give one dram thereof diſſolved in Roſe-water, or the water of wilde-ſorrel, and let the patient walk ſo ſoon as hee hath taken that powder; then let him bee laid in his bed to ſweat as I have ſhewed before.

A diſtilled water againſt the Plague.

The water following is greatly commended againſt poiſon. Take the roots of *Gentian* and *Cyperus*, of each three drams; of *Carduus benedictus*, Burnet, of each one handful; of Sorrel-ſeeds and Divels-bit, of each two pugils; of Ivie and Juniper-berries, of each half an ounce; of the flowers of Bugloſs, Violets, and red-Roſes, of each two pugils: powder them ſomwhat groſly; then ſoak or ſteep them for a night in white wine and Roſe-water: then add thereto of Bole-Armenick one ounce, of Treacle half an ounce; diſtill them all in *Balneo Mariæ*, and keep the diſtilled liquor in a vial of glaſs well covered or cloſe ſtopped for your uſe: let the patient tak ſix ounces thereof with Sugar and a little Cinnamon and Saffron: then let him walk, and then ſweat as is aforeſaid: the treacle and cordial-water formerly preſcribed, are verie profitble for this purpoſe. Alſo the the water following is greatly commended.

Another.

Take of Sorrel ſix hand-fuls; of *Rue* one handful: drie them and macerate them in vineger for the ſpace of four and twentie hours, adding thereto four ounces of Treacle: make thereof a diſtillation in *Balneo Mariæ*, and let the diſtilled water bee kept for your uſe; and ſo ſoon as the patient doth think himſelf to bee infected; let him take four ounces of that liquor, then let him walk and ſweat. Hee muſt leav ſweating when hee beginneth to wax faint and weak; or when the humor that run's down his bodie begin's to wax cold, then his bodie muſt bee wiped with warm cloaths, and dried. The patient ought not to ſweat with a full ſtomach; for ſo the heat is called away from performing the office of concoction: alſo hee muſt not ſleep when hee is in his ſweat; leſt the malignitie go inwardly with the heat and ſpirits unto the principal parts: but if the patient bee much inclined to ſleep, hee muſt bee kept from it with hard rubbing, and bands tied about the extreme parts of his bodie, and with much noiſ of thoſe that are about him, and let his friends comfort him with the good hope that they have of his recoverie; but if all this will not keep him from ſleep, diſſolv *Caſtoreum* in tart vineger, and *aqua vitæ*, and let it bee injected into his noſtrils: and let him bee kept continually wakeing the firſt day, and on the ſecond and third, even unto the fourth; that is to ſay, unto the perfect expulſion of the venom; and let him not ſleep above three or four hours on a daie and a night. In the mean time let the Phyſician that ſhall bee preſent conſider all things by his ſtrength: for it is to bee feared, that great watchings will diſſolv the ſtrength, and make the patient weak: you muſt not let him eat within three hours after his ſweating; in the mean ſeaſon, as his ſtrength ſhall require, let him take the rinde of a *preſerved* Citron, *conſerv* of Roſes, bread toſted and ſteeped in wine, the meat of *preſerved* Myrabolane, or ſom ſuch like thing.

What meat is to bee uſed in ſweating.

CHAP. XXIII.

Of Epithems to bee uſed for the ſtrengthening of the principal parts.

Whereof they muſt bee made.

THere are alſo ſom topick medicines to bee reckoned amongſt Antidotes, which muſt bee outwardly applied as ſpeedily as may bee, as cordial and hepatick Epithems for the ſafetie of the noble parts, and ſtrengthening of the faculties, as thoſe that drive the venenate air far from the bowels: they may bee made of cordial things not onely hot, but alſo cold, that they may temper the heat, and more powerfully repercuſs. They muſt bee applied warm with ſcarlet, or a double linnen cloth, or a ſoft ſponge dipped in them, if ſo bee that a Carbuncle do not poſſeſs the *regions* of the moſt noble parts; for it is not fit to uſe repercuſſives to a Carbuncle. You may make Epithems after the following forms; R. *aquar. roſ. plantag. & ſelan. an.* ℥iv. *aquæ acetoſ. vini granat. & aceti, an.* ℥iii. *ſantal. rub. & coral. rub. pulveriſ. an.* ℥iii. *theriac. vet.* ℥ß. *camph.* ℈ii. *croci* ℈i. *cariophi.* ʒß. *miſce, fiat epithema.* Or elſ, R. *aqu. roſ. & plantag. an.* ℥x.

Repercuſſives not fit to bee applied to Carbuncles.

aceti

acet. ros. ℥iv. caryoph. sant. rub. coral. rub. pulveris. pul. diamargarit. frigid. an. ʒiſs. caphuræ moschi an. ℈i. fiat epithema. Or, ℞. *aquar. rosar. & melissæ, an. ℥iv. aceti ros. ℥iii. sant. rub. ʒi. caryophil. ʒſs. croco ℈ii. caphuræ ℈i. boli arm. terra sigil. & zedoar. an. ʒi. fiat epithema.* Or elſ, ℞. *aceti ros. & aquæ rosat. an. ℔ſs. caphuæ ʒſs. theriac. & mithridat. an. ʒi. fiat epithema.* Or elſ, *aqu. rosar. nenuph. bugloſ. acetoſæ, aceti rosar. an. ℔ſs. sant. rub. ros. rub. an. ʒiii. flor. nenuph. violar. caphur. an. ʒſs. methridat. & theriac an. ʒii. terantur & misceantur simul omnia.* When you intend to uſe them, take ſom portion of them in a veſſel by its ſelf, wherewith let the affected bowel bee fomented warm.

CHAP. XXIV.

Whether purgeing and blood-letting bee neceſſarie in the beginning of peſtilent diſeaſes.

SO ſoon as the heart is ſtrengthened and corroborated with cordials and antidotes, wee muſt com to phlebotomie and purgeing. As concerning blood-letting in this caſe there is a great controverſie among Phyſicians. Thoſe that wiſh it to bee uſed, ſay or affirm that the peſtilent Fever doth infix it ſelf in the blood, and therein alſo the peſtilent malignitie taketh its ſeat; and therefore it will ſoon infect the other humors, unleſs that the blood bee evacuated, and the infection that remaineth in the blood bee thereby taken away. Contrariwiſe, thoſe that do not allow phlebotomie in this caſe, alledg, that it often commeth to paſs that the blood is void of malignitie when the other humors are infected with the venemous contagion. If anie man require my judgment in this doubtful queſtion, I ſay, that the peſtilence ſomtimes doth depend on the default of the Air: this default beeing drawn through the paſſages of the bodie, doth at length pierce unto the intrails, as wee may underſtand by the abſceſſes which break out one while behinde the ears, ſomtimes in the arm-holes, and ſomtimes in the groins, as the brain, heart or *liver* are infected. And hereof alſo com Carbuncles, and other collections of matter, and eruptions, which are ſeen in all parts of the bodie; by reaſon that nature uſeing the ſtrength of the expulſive facultie, doth drive forth whatſoever is noiſom or hurtful. Therefore if the Phyſician will follow this motion of nature, hee muſt neither purge nor *let* blood, leſt that by a contrarie motion, that is, by drawing in from without, the motion of nature which proceed's outwardly from within, ſhould bee troubled. So wee often ſee in thoſe who are purged or *let* blood for ſuch Buboes as com through unlawful copulation, that the matter is thereby made contumacious, and by drawing it inwardly, it ſpeedily cauſſeth the French Pooks.

Reaſons for and againſt blood-letting in the Plague.

The compoſing of this controverſie

Wherefore, when Buboes, Carbuncles, and other peſtilent eruption appear, which com through the default of the air, wee ought to abſtain from purgeing and phlebotomie; but it is ſufficient to fore-arm the heart inwardly and outwardly with Antidotes that are endued with a proper virtue of reſiſting the poiſon. For it is not to bee doubted, but that when nature is debilitated with both kindes of evacuation, and when the ſpirits together with the blood are exhauſted, the venemous air will ſoon pierce, and bee received into the emptie bodie, where it exerciſeth its tyrannie to the utter deſtruction thereof.

In the year of our Lord God 1566. in which year there was greaat mortalitie throughout all France, by reaſon of the peſtilence and peſtilent diſeaſes, I earneſtly and diligently inquired of all the Phyſicians and Chyrurgians of all the Citties (through which King *Charls* the Ninth paſſed in his progreſs unto *Bayon*) what ſucceſs their patient had after they were *let* blood and purged; whereunto they all anſwered alike, that they had diligently obſerved, that all that were infected with the Peſtilence, and were *lett* bleed ſom quantitie of blood, or had their bodies ſomwhat ſtrongly purged, thenceforwards waxed and weaker, and ſo at length died; but others which were not *let* blood nor purged, but took cordial Antidotes inwardly, and applied them outwardly, for the moſt part eſcaped and recovered their health: for that kinde of Peſtilence took its original of the primitive and ſolitarie default of the Air, and not of the corruption of the humors.

An hiſtorie.

The like event was noted in the hoarſneſs that wee ſpake of before: that is to ſay, that the patients waxed worſ and worſ by purgeing and phlebotomie; but yet I do not diſallow either of thoſe remedies, if there bee great fulneſs in the bodie, eſpecially in the beginning, and if the matter have a cruel violence, whereof may bee feared the breaking in unto ſom noble part. For wee know that it is confirmed by *Hippocrates*, that what diſeaſ ſoever is cauſſed by repletion, muſt bee cured by evacuation; and that in diſeaſes that are verie ſharp, if the matter do ſwell, it ought to be remedied the ſame day, for delaie in ſuch diſeaſes is dangerous; but ſuch diſeaſes are not cauſſed or inflicted upon man's bodie by reaſon or occaſion of the peſtilence, but of the diſeaſed bodies, and diſeaſes themſelvs commixed together with the peſtilence: therefore then peradventure it is lawful to purge ſtrongly, and to *let* a good quantitie of blood, leſt that the peſtilent venom ſhould take hold of the matter that is prepared, and ſo infect it with a contagion, whereby the peſtilence taketh

When purging and bleeding may bee uſed.

Aph. 22. ſect. 2.
Aph. 10. ſect. 4.

taketh new and for greater ſtrength; eſpecially as *Celſus* admoniſheth us, where hee ſaith, that, by how much the ſooner thoſe ſudden invaſions do happen, by ſo much the ſooner remedies muſt bee uſed, yea or rather raſhly applied; therefore if the veins ſwell, the face wax fierie red; if the arteries of the *temples* beat ſtrongly; if the patient can verie hardly breath by reaſon of a weight in his ſtomach; if his ſpittle bee bloodie; then ought hee to bee let blood without delaie, for the cauſſes before-mentioned. It ſeem's beſt to open the *Liver*-vein on the left arm, whereby the heart and ſpleen may bee better diſcharged of their abundant matter; yet blood-letting is not good at all times, for it is not expedient when the bodie beginneth to wax ſtiff by reaſon of the comming of a Fever; for then by drawing back the heat and ſpirits inwardly, the outward parts beeing deſtitute of blood, wax ſtiff and cold; therefore blood cannot bee letten then without great loſs of the ſtrength, and perturbation of the humors. And it is to bee noted, that when thoſe plethorick cauſes are preſent, there is one Indication of blood-letting in a ſimple peſtilent Fever, and another in that which hath a *Bubo*, *id eſt*, a Botch or a Carbuncle joined therewith. For in one or both of theſe, beeing joined with a vehement and ſtrong burning Fever, blood muſt bee letten by opening the vein that is neareſt unto the tumor or ſwelling againſt nature, keeping the ſtraightneſs of the *fibres*, that this beeing open, the blood might bee drawn more directly from the part affected; for all and everie retraction of putrefied blood unto the noble parts, is to bee avoided, becauſ it is noiſom and hurtful to nature, and to the patient. Therefore, for example ſake, admit the patient bee plethorick by repletion; which is called *Ad Vaſa*, *id eſt*, unto the Veſſels, and *Ad Vires*, *id eſt*, unto the Strength: and therewithal hee hath a tumor that is peſtilent in the parts belonging unto head or neek; the blood muſt bee *let* out of the cephalick or median vein, or out of one of their branches diſperſed in the arm on the grieved ſide. But if through occaſion of fat, or anie other ſuch like cauſ, thoſe veins do not appear in the arm, there bee ſom that give counſel in ſuch a caſe to open the vein that is between the fore-finger and the thumb, the hand beeing put into warm water, whereby that vein may ſwell and bee filled with blood gathered thither by means of the heat.

Cap. 7. Lib. 3.

Why blood muſt bee *let* on the left arm in the Plague.

If the tumor bee under the arm-hole, or about thoſe places, the *liver*-vein, or the median muſt bee opened which runneth along'ſt the hand: if it bee in the groin, the vein of the hamm, or *Saphena*, or anie other vein above the foot that appeareth well, but alwaies on the grieved ſide. And phlebotomie muſt bee performed before the third daie: for this diſeaſ is of the kinde or nature of ſharp diſeaſes; becauſ that within four and twentie hours it runneth paſt help. In letting of blood you muſt have conſideration of the ſtrength. You may perceiv that the patient is readie to ſwound, when that his forehead waxeth moiſt, with a ſmall ſweat ſuddenly ariſeing, by the akeing or pain at the ſtomach, with an appetite to vomit, and deſire to go to ſtool, gapeing, blackneſs of the lips, and ſudden alteration of the face unto paleneſs: and laſtly moſt certainly by a ſmall and ſlow pulſ: and then you muſt lay your finger on the vein, and ſtop it until the patient com to himſelf again, either by nature, or elſ reſtored by art; that is to ſay, by giveing unto him bread dipped in wine, or anie other ſuch like thing: then if you have not taken blood enough, you muſt let it go again, and bleed ſo much as the greatneſs of the diſeaſ, or the ſtrength of the patient will permit or require: which beeing don ſom of the Antidotes that are preſcribed before will bee verie profitable ro bee drunk, which may repair the ſtrength, and infringe the force of the malignitie.

CHAP. XXV.

Of purgeing medicines in a Peſtilent diſeaſ.

What purges fit in the Plague.

IF you call to minde the proper indications, purgeing ſhall ſeem neceſſarie in this kinde of diſeaſ, and that muſt bee preſcribed as the preſent caſe and neceſſitie requireth; rightly conſidering that the diſeaſ is ſudden, and doth require medicines that may with all ſpeed drive out of the bodie the hurtful humor wherein the noiſom qualitie doth lurk and is hidden; which medicines are divers by reaſon of the diverſitie of the kinde of the humor, and the condition or temperature of the patient. For this purpoſe ſix grains of Scammonie beaten into powder, or elſ ten grains are commonly miniſtred to the patient with one dram of Treacle. Alſo pils may bee made in this form: Take of Treacle and Mithridate, of each one dram; of *Sulphur vivum* finely powdred half a dram; of *Diagridium* four grains: make thereof Pils. Or, take three drams of Aloës; of Myrrh and Saffron of each one dram; of white Hellebore and *Aſarabacca*, of each four ℈. make thereof a maſs with old treacle, and let the patient take four ſcruples thereof for a doſe, three hours before meat. *Ruffus* his pils may bee profitably given to thoſe that are weak. The antient Phyſicians have greatly commended Agarick for this diſeaſ, becauſ it doth draw the noiſom humors out of all the members: and

Pils.

and the virtues thereof are like unto those of Treacle; for it is thought to strengthen the heart, and to draw out the malignitie by purgeing. To those that are strong, the weight of two drams may bee given, and to those that are more weak, half a dram. It is better to give the infusion in a decoction, then in substance; for beeing elected and prepared truly into Trochisces, it may bee called a divine kinde of medicine.

Antimonium is highly praised by the experience of manie; but becaus I know the use thereof is condemned by the councel and decree of the School of Physicians at Paris, I will here ceas to speakof it.

Those medicines that caus sweats are thought to excel all others, when the Pestilence commeth of the venemous Air; among whom the efficacie of that which followeth hath been prooved, to the great good of manie in that Pestilence which was lately throughout all Germanie, as *Matthias Rodler* Chancellor to Duke *George* the Count Palatine signified unto mee by letters.

They do take a bundle of Mugwurt, and of the ashes thereof after it is burn't, they make a lee with four pintes of water; then they do set it over the fire, and boil it in a vessel of earth well leaded, until the liquor bee consumed, the earthie dregs falling into the bottom like unto salt, whereof they make Trochisces of the weight of a crown of gold: then they dissolv one or two of these Trochisces, according to the strength of the patient, in good Muskadine, and give it the patient to drink, and let him walk after that hee hath drunk it for the space of half an hour; then lay him in his bed, and there sweat him two or three hours, and then hee will vomit, and his bellie will bee loosed as if hee had taken Antimonie; and so they were all for the most part cured, especially all those that took that remedie betimes: and before the diseas went to their heart; as I my self have prooved in som that were sick at Paris, with most happie succes: Truely Mugwurt is highly commended by the Antient Physicians, beeing taken and applied inwardly or outwardly against the biteings of venemous creatures; so that it is not to bee doubted but that it hath great virtue against the Pestilence.

An effectual sudorifick and also purgeing medicine.

The virtues of Mugwurt.

I have heard it most certainly reported by *Gilbertus Heroaldus* physician of *Mompilier*, that eight ounces of the pickle of Anchovis, drunk at one draught, is a most certain & approved remedie against the Pestilence, as hee and manie other have often found by experience For the Plague is no other thing but a verie great putrefaction; for the correction and amendment whereof, there is nothing more apt or fit then this pickle or substance of Anchovis, beeing melted by the Sun and force of the salt that is strewed thereon. There bee som which infuse one dram of Walwurt-seed in white wine, and affirm that it drunken wil perform the like effect as Antimonie. Others dissolv a little weight of the seed of *Rue* beeing bruised in Muskadine, with the quantitie of a bean of Treacle, and so drink it. Others beat or bruis an handful of the leavs or tops of Broom in half a pinte of white wine, and so give it to the patient to drink, to caus him to vomit, loos his bellie, and make him to sweat. Truly those that are wounded or bit with venemous beasts, If they binde broom above the wound, it will prohibit or hinder the venom from dispersing it self, or going anie further: therefore a drink made thereof will prohibit the venom from going anie nearer the heart. Som take of the root of Elecampane, *Gentian*, Tormentil, Kermes-berries and broom; of the powder of Ivorie and Hartshorn, of each half a dram: they do bruis and beat all these, and infuse them for the space of four and twentie hours in white wine and *aqua vitæ* on the warm embers, and then strain it, and give the patient three or four ounces thereof to drink; this provoke's sweat, and infringeth the power of the poisons: and the potion following hath the same virtue.

Vide Rondelet. Lib.7. de pis.c3.

Take good Mustard half an ounce; of Treacle or Mithridate the weight of a bean; dissolv them in white wine, and a little *aqua vitæ*, and let the patient drink it, and sweat thereon with walking. You may also rost a great Onion made hollow, and filled with half a dram of Treacle and vineger under the embers; and then strain it, and mix the juice that is pressed out of it with the water of Sorrel, *Carduus Benedictus*, or anie other cordial thing, and with strong wine; and give the patient to drink thereof to provoke sweat, and to repel the malignitie. Or elsTake as much Garlick as the quantitie of a big Nut; of *Rue* and Celandine, of each twentie leavs; bruis them all in white wine and a little *aqua vitæ*; then strain it, and give the patient thereof to drink. There bee som that do drink the juice that is pressed out of Celandine and Mallows, with three ounces of Vineger, and half an ounce of the oil of Wall-nuts, and then by much walking do unburthen their stomach and bellie upwards and downwards, and so are helped. When the venemous air hath already crept into and infected the humors, one dram of the dried leavs of the Bay-tree macerated for the space of two daies in Vineger and drunk, is thought to bee a most soveraign medicine to provoke sweat, loosnes of the bellie, and vomiting.

A Potion.

Matthiolus in his Treatise *de Morbo gallico* writeth, that the powder of *Mercurie* ministred unto the patient with the juice of *Carduus Benedictus*, or with the Electuarie *de Gemmis*, will drive away the pestilence before it bee confirmed in the bodie, by provokeing vomit, loos-

neſs of the bellie and ſeat: one dram of Calchanchum or white Copperas diſſolved in Roſe-water, performeth the like effect in the ſame diſeaſ. Som do give the patient a little quantitie of the oil of Scorpions with white wine to expel the poiſon by vomit, and therewithal they annoint the region of the heart, the breſt and the wriſts of the hands. I think theſe verie meet to bee uſed often in bodies that are ſtrong and well exerciſed, becauſ weaker medicines do evacuate little or nothing at all, but onely moov the humors, whereby commeth a Fever. When a ſufficient quantitie of the malignitie is evacuated, then you muſt miniſter things that may ſtrengthen the bellie and ſtomach, and with-hold the agitation or working of the humors: and ſuch is the confection of Alkermes.

CHAP. XXVI.

Of manie Symptoms which happen together with the Plague: and firſt of the pain of the head.

The cauſ of phrenſie in the Plague.

IF the malignitie bee carried into the brain, and nature bee not able to expel it, it inflame's not onely it, but alſo the membranes that cover it: which inflammation doth one while hurt, trouble, or aboliſh the imagination; another while the judgment; and ſomtimes the memorie; according to the ſituation of the inflammation, whether it bee in the former, hinder, or middle part of the head; but hereof commeth alwaies a Phrenſie, with fierie redneſs of the eies and face and heavineſs and burning of the whole head. If this will not bee amended with Clyſters, and with opening the Cephalick vein in the arm, the arteries of the *temples* muſt bee opened, takeing ſo much blood out of them, as the greatneſs of the Symptoms and the ſtrength of the patient ſhall require and permit. Truly the inciſion that is made in opening of an arterie will cloſe and join together as readily, and with as little difficultie, as the inciſion of a vein. And of ſuch an inciſion of an arterie, commeth preſent help; by reaſon that the tenſive and ſharp vapors do plentifully breath out together with the arterious blood. It were alſo verie good to provoke a flux of blood at the noſe, if nature bee apt to exonerate herſelf that way. For as *Hippocrates* ſaith, when the head is grieved, or generally aketh, if matter, water, or blood flow out at the noſtrils, mouth, or ears, it preſently cure's the diſeaſ. Such bleeding is to bee provoked by ſtrong blowing, or ſtriveing to cleanſ the noſe, by ſcratching or picking of the inner ſide of the noſtrils, by pricking with an horſ-hair, and long holding down of the head.

The benefit of opening an arterie.

Aph. 10. ſect. 6.

An hiſtorie.

The Lord of *Fontains*, a Knight of the Order, when wee were at *Bayon*, had a bleeding at the noſe, which came naturally for the ſpace of two daies, and thereby hee was free'd of a peſtilent Fever which hee had before, a great ſweat riſeing therewithal, and ſhortly after his Carbuncles came to ſuppuration, and by God's grace hee recovered his health beeing under my cure. If the blood do flow out and cannot bee ſtopped when it ought, the hands, arms, and legs muſt bee tied with bands; and ſponges wet in Oxycrate muſt bee put under the arm-holes, cupping-glaſſes muſt bee applied unto the dugs, the *region* of the *Liver* and Spleen; and you muſt put into the noſtrils, the doun of the willow-tree, or anie other aſtringent medicine, incorporated with the hairs pluck't from the flank, bellie or throat of an Hare, Bole-Armenick, *Terra Sigillata*, the juice of Plantane and Knot-graſs mixed together; and furthermore the patient muſt bee placed or laied in a cool place. But if the pain bee nothing mitigated notwithſtanding all theſe fluxes of blood, wee muſt com to medicines that procure ſleep, whoſe forms are theſe.

To ſtay bleeding.

Medicines to procure ſleep.

Take of green Lettuce one handful; flowrs of water-Lillies and Violets, of each two pugils; one head of white-Poppie bruiſed; of the four cold ſeeds, of each two drams; of Liquorice and Raiſins, of each one dram: make thereof a decoction, and in the ſtraining diſſolv one ounce and a half of *Diacodion*: make thereof a large potion to bee given when they go to reſt. Alſo Barlie-cream may bee prepared in the water of water-Lillies and of Sorrel, of each two ounces; adding thereto ſix or eight grains of *Opium*: of the four cold ſeeds, and of white-Poppie ſeeds, of each half an ounce; and let the ſame bee boiled in broths with Lettuce and Purſlain; alſo the pills *de Cynogloſſo*, *i. e.* Hounds-tongue may bee given. Clyſters that provoke ſleep muſt bee uſed which may bee thus prepared.

Take of Barlie-water half a pinte; oil of Violets and water-Lillies, of each two ounces; of the water of Plantain and Purſlain, or rather of their juices, three ounces; of Camphir ſeven grains, and the whites of three eggs: make thereof a Clyſter. The head muſt bee fomented with Roſe-vineger, the hair beeing firſt ſhaven away, leaving a double cloth wet therein on the ſame, and often renewed. Sheeps-lungs taken warm out of the bodies, may bee applied to the head, as long as they are warm. Cupping-glaſſes with and without ſcarification may bee applied to the neck and ſhoulder-blades. The arms and legs muſt bee ſtrongly bound, beeing firſt well rubbed to divert the ſharp vapors and humors from the head. Frontals may alſo bee made on this manner. Take of the oil of Roſes and water-Lillies, of each two ounces; of the oil of Poppie half an ounce; of *Opium*, one dram; of Roſe-vineger, one ounce; of Camphir half a dram; mix them together. Alſo Nodules

may

may bee made of the flowrs of Poppies, Henbane, water-Lillies, Mandrags beaten in Roſe-water with a little Vineger, and a little Camphir, and let them bee often applied to the noſtrils: for this purpoſe Cataplaſms alſo may bee laid to the forehead. As, Take of the mucilage of the ſeeds of *Pſilium, id eſt.* Flea-wurt, and Quince-ſeeds extracted in Roſe-water, three ounces; of Barlie-meal four ounces; of the powder of Roſe-leavs, the flowers of water-Lillies and Violets, of each half an ounce; of the ſeeds of Poppies and Purſlain, of each two ounces; of the water and vineger of Roſes, of each three ounces: make thereof a Cataplaſm, and applie it warm unto the head. Or take of the juice of Lettuce, water-Lillies, Henbane, Purſlain, of each half a pinte; of Roſe-leavs in powder, the ſeeds of Poppie, of each half an ounce; oil of Roſes three ounces; of vineger two ounces; of Barlie-meal as much as ſhall ſuffice: make thereof a Cataplaſm in the form of a liquid Pultis. When the heat of the head is mitigated by theſe medicines, and the inflammation of the brain aſſwaged, wee muſt com unto digeſting and reſolving fomentations, wich may diſperſ the matter of the vapors. But commonly in pain of the head, they do uſe to binde the forehead and hinder part of the head verie ſtrongly, which in this caſe muſt bee avoided.

A Cataplaſm.

CHAP. XXVII.

Of the heat of the Kidnies.

THe heat of the Kidnies is tempered by annointing with *unguent. refrigerans Galen* newly made, adding thereto the whites of eggs well beaten, that ſo the ointment may keep moiſt the longer; let this liniment bee renewed everie quarter of an hour, wipeing away the reliques of the old. Or, ℞, *aq. roſ.* ℔ß. *ſucci plant.* ℥iv. *alb. ovorum* iv. *olei roſacei, & nenuph. an.* ℥ii. *aceti roſ.* ℥iii. *miſce ad uſum.* When you have annointed the part, lay thereon the leavs of water-Lillies or the like hold herbs, and then preſently thereupon a double linnen cloth dipped in oxycrate and wrung out again, and often changed; the patient ſhall not lie upon a fether-bed, but on a quilt ſtuffed with the chaff of Oats, or upon a Mat with manie doubled cloaths or Chamelet ſpread thereon. To the *region* of the heart may in the mean time bee applied a refrigerateing and alexiterial medicine, as this which followeth. ℞. *ung. roſat.* ℥iii. *olei nenuphar ini,* ℥ii. *acet. roſ. & aq. roſ. an.* ℥i. *theriacæ,* ℥i. *croci,* ℥ß. Of theſe melted and mixed together make a ſoft ointment, which ſpred upon a ſcarlet cloth may bee applied to the *region* of the heart. Or, ℞. *theriacæ opt.* ℥iß. *ſucci citri acidi, & limonis, av* ℥ß. *coral. rub. & ſem. roſar. rub. an.* ℥ß. *caphuræ & croci, an.* gra. iiii. let them bee all mixed together, and make an ointment or liniment.

An ointmene for the reins.

An ointmene for the heart.

At the head of the patient as hee lie's in his bed, ſhall bee ſet an Ewr or cock with a baſin under it to receiv the water, which by dropping may reſemble rain. Let the ſoles of the feet and palms of the hands bee gently ſcratched, and the patient lie far from noiſ, and ſo at length hee may fall to ſom reſt.

The noiſ of dropping water draw's on ſleep.

CHAP. XXVIII.

Of the Eruption and Spots, which commonly are called by the name of Purples and Tokens.

THe skin, in peſtilent Fevers, is marked and variegated in divers places with ſpots, like unto the biteings of Fleas or Gnats, which are not alwaies ſimple, but manie times ariſe in form like unto a grain of millet. The more ſpots appear, the better it is for the patient: they are of divers colors according to the virulencie of the malignitie, and condition of the matter, as red, yellow, brown, violet or purple, blew and black. And becauſ for the moſt part they are of a purple color, therefore wee call them purples. Others call them *Lenticulæ*; becauſ they have the color and form of Lentiles. They are alſo called *Papiliones, (i.)* Butterflies; becauſ they do ſuddenly ſeiz or fall upon divers *regions* of the bodie, like unto winged Butterflies; ſomtimes the face, ſomtimes the arms and legs, and ſomtimes all the whole bodie; oftentimes they do not onely affect the upper part of the ſkin, but go deeper into the fleſh, ſpecially when they proceed of matter that is groſs and aduſt. They do ſomtimes appear great and broad, affecting the whole arm, leg or face, like unto an *Eryſipelas:* to conclude, they are divers according to the varietie of the humor that offend's in quantitie or qualitie.

The differences of the ſpots in the Plague:

Their ſeveral names, and the reſons of them.

If they are of a purple or black color, with often ſwounding, and ſink in ſuddenly without anie manifeſt cauſ, they fore-ſhew death.

When ſigns of death.

The cauſ of the breaking out of thoſe ſpots, is the working or heat of the blood, by reaſon of the crueltie of the venom received, or admitted. They often ariſe at the beginning of a peſtilent Fever: manie times before the breaking out of the Sore, or Botch or Carbuncle, and

and manie times after: but then they ſhew ſo great a corruption of the humors in the bodie, that neither the ſores nor carbuncles will ſuffice to receiv them; and therefore they appear as fore-runners of death. Somtimes they break out alone, without a botch or carbuncle, which if they bee red, and have no evil ſymptoms joyned with them, they are not wont to proov deadlie: they appear, for the moſt part, on the third or fourth daie of the diſeaſ, and ſomtimes later, and ſomtimes they appear not before the patient bee dead; becauſ the working or heat of the humors beeing the off-ſpring of putrefaction, is not as yet reſtrained and ceaſed.

Why they ſomtimes appear after the death of the patient.

Wherefore then principally the putrid heat, which is greateſt a little before the death of the patient, drive's the excremental humors, which are the matter of the ſpots unto the skin; or elſ, becauſ nature in the laſt conflict hath contended with ſom greater endeavor then before (which is common to all things that are readie to die) a little before the inſtant time of death, the peſtilent humor beeing preſently driven unto the skin; and nature thus weakned by theſe extreme conflicts falleth down proſtrate, and is quite overthrown by the remnant of the matter.

CHAP. XXIX.

Of the cure of Eruptions and Spots.

They are to bee cured by driveing forthly.

YOu muſt firſt of all take heed, leſt you drive in the humor that is comming outwards with repercuſſives: therefore beware of cold, all purgeing things, phlebotomie, and drowſie or ſound ſleeping. For all ſuch things do draw the humors inwardly, and work contrarie to nature. But it is better to provoke the motion of nature outwardly, by applying of drawing medicines outwardly, and miniſtring medicines to provoke ſweat inwardly; for otherwiſe by repelling and ſtopping the matter of the eruptions, there will bee great danger, leſt the heart bee oppreſſed with the abundance of the venom flowing back; or elſ by turning into the bellie, it inferr's a mortal bloodie flux: which diſcommodities that they may bee avoided, I have thought good to ſet down this remedie, whoſe efficacie I have known and prooved manie times, and on divers perſons, when by reaſon of the weakneſs of the expulſive facultie, and the thickneſs of the skin, the matter of the ſpots cannot break forth, but is conſtrained to lurk under the skin, lifting it up into bunches and knobs.

The indication of cureing taken from the like.

I was brought unto the invention of this remedie, by compariſon of the like. For when I underſtood, that the eſſence of the French pocks (and likewiſe of the peſtilence) conſiſted in a certain hidden virulencie, and venemous qualitie, I ſoon deſcended unto that opinion, that even as by the annointing of the bodie with the unguent compounded of Quick-ſilver, the groſs and clammie humors which are fixed in the bones, and unmoovable, are diſſolved, relaxed, and drawn from the center into the ſuperficial parts of the bodie, by ſtrengthening and ſtirring up the expulſive facultie, and evacuated by ſweating and fluxing at the mouth; that ſo it ſhould com to paſs in peſtilent fevers, that nature beeing ſtrengthened with the ſame kinde of unction, might unload her ſelf of ſom portion of the venemous and peſtilent humor, by opening the pores and paſſages, and letting it break forth into ſpots and puſtles, and into all kinde of eruptions. Therefore I have annointed manie in whom nature ſeemed to make paſſage for the venemous matter verie ſlowly, firſt looſing their bellie with a glyſter, and then giveing them treacle-water to drink, which might defend the vital facultie of the heart, but yet not diſtend the ſtomach, as though they had the French pocks, and I obtained my expected purpoſe: In ſtead of the treacle-water you may uſe the decoction of *Guaicum*, which doth heat, drie, provoke ſweat, and repel putrefaction, adding thereto alſo vineger, that by the ſubtiltie thereof, it may pierce the better, and withſtand the putrefaction. This is the deſcription of the unguent.

An ointment to draw them forth when as they appear too ſlowly.

Take of Hogſ-greaſ one pound, boil it a little with the leavs of *Sage*, *Time*, Roſemarie, of each half an handfull, ſtrain it, and in the ſtraining extinguiſh five ounces of Quick-ſilver, which hath been firſt boiled in vineger with the fore-mentioned herbs; of *Sal Nitrum* three drams; the yelks of three eggs boiled until they bee hard: of Treacle and Mithridate, of each half an ounce; of Venice-Turpentine, oil of Scorpions and Bays, of each three ounces; incorporate them altogether in a mortar, and make thereof an unguent, wherewith annoint the patient's arm-holes and groins, avoiding the parts that belong to the head, breaſt, and back-bone: then let him bee laid in his bed, and covered warm, and let him ſweat there for the ſpace of two hours, and then let his bodie bee wiped and cleanſed; and if it may bee, let him bee laid in another bed, and there let him bee refreſhed with the broth of the decoction of a Capon, reer eggs, and with ſuch like meats of good juice that are eaſie to bee concocted and digeſted; let him bee annointed the ſecond and third daie, unleſs the ſpots appear before.

If the patient flux at the mouth, it muſt not be ſtopped: when the ſpots and puſtles do all appear, and the patient hath made an end of ſweating, it ſhall bee conveniente to uſe diuretick

diuretick medicines, for by these the remnant of the matter of the spot, which happily could not all breath forth, may easily bee purged and avoided by urine.

If anie noble or gentlemen refuse to bee annointed with this unguent, let them bee enclosed in the bodie of a Mule or Horse that is newly killed, and when that is cold, let them bee laied in another, until the pustles and eruptions do break forth, beeing drawn by that natural heat. For so *Matthiolus* writeth that *Valentinus*, the son of Pope *Alexander* the sixt, was delivered from the danger of most deadlie poison which hee had drunk. *In proem. lib. 6. Dioſc.*

CHAP. XXX.

Of a pestilent Bubo, *or Plague-sore.*

A Pestilent *Bubo* is a tumor at the beginning long and moveable, and in the state, and full perfection copped, and with a sharp head, unmoveable and fixed deeply in the glandules, or kernels; by which the brain exonerate's it self of the venemous and pestiferous matter into the kernels that are behinde the ears, and in the neck: the heart into those that are in the arm-holes; and the *Liver*, into those that are in the groin; that is, when all the matter is gross and clammie, so that it cannot bee drawn out by spots and pustles breaking out on the skin; and so the matter of a Carbuncle is sharp, and so fervent, that it maketh an *Eschar* on the place where it is fixed. In the beginning, while the *Bubo* is breeding, it maketh the patient to feel, as it were, a cord or rope stretched out in the place, or a hardned nerv with pricking pain: and shortly after the matter is raised up as it were into knob, and by little and little it groweth bigger, and is inflamed, these accidents before mentioned accompanying it. If the tumor be red, and increas by little & little, it is a good and salutarie sign: but if it bee livid or black, and com verie slowly unto his just bigness, it is a deadlie sign; It is also a deadlie sign if it increas suddenly, and com to his just bigness as it were with a swift violence, and as in a moment, have all the symptoms in the highest exces; as pain, swelling and burning. Buboes or Sores appear sometimes of a natural color, like unto the skin, and in all other things like unto an œdematous tumor, which notwithstanding will suddenly bring the patient to destruction; like those that are livid and black, wherefore it is not good to trust too much to those kindes of tumors.

What a pestilent *Bubo* is.

The signs of *Bubo's* salutarie and deadlie.

CHAP. XXXI.

Of the cure of Buboes, *or Plague-sores.*

SO soon as the Bubo appear's, applie a Cupping-glass with a great flame unto it, unless it bee that kinde of Bubo which will suddenly have all the accidents of burning and swelling in the highest nature; but first the skin must bee annointed with the oil of lillies, that so it beeing made more loos, the Cupping-glass may draw the stronger and more powerfully; it ought to stick to the part for the space of a quarter of an hour, and bee renewed and applied again everie three quarters of an hour, for so at length the venom shall bee the better drawn forth from anie noble part that is weak, and the work of suppuration or resolution, which soever nature hath assailed, will the better and sooner bee absolved and perfected: which may bee also don by the application of the following ointment.

The use of cupping-glasses in cureing of a *Bubo*.

Take of *Unguentum Dialthæa* one ounce and a half; oil of Scorpions half an ounce; of Mithridate dissolved in *Aqua vitæ*, half a dram; this liniment will verie well relax and loosen the skin, open the pores thereof, and spend forth portion of that matter which the Cupping-glass hath drawn thither: in stead thereof mollifying fomentations may bee made, and other drawing and suppurating medicines, which shall bee described hereafter.

A liniment.

A vesicatorie applied in a meet place below the Bubo profit's them verie much but not above; as for example. If the Bubo bee in the throat, the Vesicatorie must bee applied unto the shoulder-blade on the same side; if it bee in the arm-holes, it must bee applied in the mid'st of the arm, or of the shoulder-bone, on the inner side: if in the groin, in the mid'st of the thigh on the inner side, that by the double passage that is open for to draw out the matter, the part wherein the venom is gathered together, may bee the better exonerated.

Spurge, Crow-foot, Arsmart, Bear-foot, Brionie, the middle bark of Travellers-joy, the rindes of Mullet, *Flammula* or upright Virgins-bower, are fit for raising blisters. If you cannot com by those simple medicines, you may applie this which followeth, which may bee prepared at all times.

Take *Cantharides*, Pepper, *Euphorbium*, Pellitorie of Spain, of each half a dram; of sower leaven, two drams; of Mustard one dram, and a little Vineger; the vineger is added there-to to withhold or restrain the vehemencie of the *Cantharides*; but in want of this medicine it shall suffice to drop scalding oil or water, or a burning candle, or to lay a burning coal on

A compound vesicatorie.

on the place: for ſo you may raiſ bliſters, which muſt preſently bee cut away, and you muſt ſee that you keep the ulcers open & flowing as long as you can, by applying the leav's of red-colwurts, Beets, or Ivie dipped in warm water, and annointed with oil or freſh butter. Som applie Cauteries, but Veſicatories work with more ſpeed: for before the Eſchar of the Cauteries will fall away, the patient may die: therefore the ulcers that are made with Veſicatories will ſuffice to evacuate the peſtilent venom, becauſ that doth work rather by its qualitie then by its quantitie. Let the abſceſs bee fomented as is ſhewed before: and then let the medicine following, which hath vertue to draw, bee applied.

Why veſicatories are better then cauteries in a peſtilent *Bubo*.

Fill a great onion, beeing hollowed, with Treacle and the leav's of *Rue*, then roſt it under the hot Embers, beat it with a little Leaven, and a little Swines-greaſ, and ſo applie it warm unto the abſceſs or ſore; let it bee changed everie ſix hours. Or take the roots of Marſh-mallows and Lillies, of each half a pound; of *Line*, Fenugreek, and Muſtard-ſeeds, of each half an ounce; of Treacle one dram; ten Figs, and as much Hogs-greaſ as ſhall ſuffice: make thereof a cataplaſm according to Art. Or, take of Onions and Garlick roſted in the Embers, of each three ounces: bruiſ them with one ounce of ſowr leaven, adding thereto *Unguentum Baſilicon*, one ounce; Treacle one dram; Mithridate half a dram; of old Hogs-greaſ on ounce; of *Cantharides* in powder one ſcruple; of Pigeons-dung two drams: beat them and mix them together into the form of a cataplaſm. Hereunto old Rennet is verie profitable, for it is hot, and therefore attractive, beeing mixed with old Leaven and *Baſilicon*: you ought to uſe theſe until the abſceſs bee grown unto its full ripeneſs and bigneſs; but if preſently after the beginning there bee great inflammation, with ſharp pain, as it often happeneth, eſpecially when the abſceſſes bee of the kinde of Carbuncles; wee muſt abſtain from thoſe remedies that are hot and attractive, and alſo from thoſe that are verie emplaſtick and clammie; becauſ they do altogether cloſe the pores of the ſkin; or becauſ they reſolv the thinner part of the collected matter, which if it might remain, would bring the other ſooner to ſuppuration: or elſ becauſ they may perchance draw more quantitie of the hot matter then the part can bear; whereof commeth rather corruption then maturation: and laſt of all becauſ they increaſ the fever and pain, which inferreth danger of a convulſion or mortal Gangrene. Therefore in ſuch a caſe it is beſt to uſe cold and temperate local medicines, as the leavs of Henbane and Sorrel roſted under the coales, *Galen's* pultis, and ſuch like.

Strong drawing cataplaſmes.

There are manie that for fear of death, have with their own hands pulled away the *Bubo* with a pair of Smiths-pincers: others have digged the fleſh round about it, and ſo gotten it wholly out. And to conclude others have becom ſo mad, that they have thruſt an hot iron into it with their own hand, that the venom might have a paſſage forth: of all which I do not allow one; for ſuch abſceſſes do not com from without, as the biteings of virulent beaſts, but from within, and moreover becauſ pain is by theſe means increaſed, and the humor is made more malign and fierce. Therefore I think it ſufficient to uſe medicines that relax, open the pores of the ſkin, and digeſt portion of the venom by tranſpiration, as are theſe that follow. Take the roots of Marſh-mallows and Lillies, of each ſix ounces; of Camomil and Melilot-flowers, of each half an handful; of Lin-ſeeds half an ounce; of the leav's of *Rue* half an handful: boil them and ſtrain them, dip ſponges in the ſtraining, and therewith let the tumor bee fomented along time. Or, take the crum of hot bread, and ſprinkle it with Treacle-water, or with *aqua vitæ*, and Cows-milk or Goats-milk, and the yelks of three egs, put them all on ſtupes or flax, and applie them warm unto the place. Or, take of ſowr Rie-leaven four ounces; of *Baſilicon* two ouuces; three yelks of egs; oil of Lillies two ounces; Treacle one dram: let bee received on ſtupes, and applied in like manner. Or, take of *Diachylon* and *Baſilicon*, of each two ounces; oil of Lillies one ounce and an half: let them bee melted and mixed together, and let it bee applied as is aboveſaid. When you ſee, feel and know, according to reaſon, that the *Bubo* is com to perfect ſuppuration, it muſt bee opened with an inciſion-knife, or an actual or potential Cauterie, but it is beſt to bee don with a potential Cauterie, unleſs that happely there bee great inflammation, becauſ it doth draw the venom from beneath unto the ſuperficial parts, and maketh a larger orifice for the matter that is contained therein: neither muſt it be looked for, that nature ſhould open it of her ſelf; for then there were danger that leſt while nature doth work ſlowly, a venemous vapor ſhould bee ſtirred up, which ſtrikeing the heart by the arteries, the brain by the nervs, and the liver by the veins, ſhould cauſ a new increaſ of the venemous infection. For fear whereof there bee ſom that will not expect the perfect maturation and ſuppuration, but as it were in the mid'ſt of the cruditie and maturitie will make an orifice for it to paſs forth at: yet if it bee done before the tumor bee at his perfect maturitie, pain, a Fever, and all accidents are ſtirred up and enraged, whereof commeth a malign ulcer that often degenerat's into a Gangrene. For the moſt part about the tenth or eleventh daie the work of ſuppuration ſeemeth perfected and finiſhed; but it may bee ſooner or later by reaſon of the application of medicines, the condition of the matter, and ſtate of the part: when the matter commeth forth, you muſt yet uſe ſuppurative and mollifying medicines, to maturate

Againſt ſuch as cut away Plague-ſores.

A digeſtive fomentation.

An anodyne Cataplaſm.

Why it is beſt to open a plague-ſore with a potential cauterie.

maturate the remains thereof; in the mean while cleansing the ulcer by putting mundificatives into it, as wee shall declare in the cure of Carbuncles. But if the tumor seem to sink in, or hide it self again, it must bee revoked and procured to com forth again, by applying of Cupping-glasses with scarification, and with sharp medicines, yea, and with Cauteries both actual and potential. How to draw forth a sore that seem's to go in again.

When the Cauteries are applied, it shall bee verie good to applie a vesicatorie a little below it, that there might bee som passage open for the venom while the Eschar is in falling away. For so they that are troubled with the French-Pocks, so long as they have open and flowing ulcers, so long are they void of any pain that is worth the speaking of; which ulcers beeing closed and cicatrized, they do presently complain of great pain. If you suspect that the *Bubo* is more malign by reason that it is of a green, or black and inflamed color, as are those that com of a melancholick humor by adustion, turned into a gross and rebellious melancholick humor, so that by the more copious influx thereof into the part, there is danger of a gangrene and mortification; then the places about the abscess must bee armed with repercussives, but not the abscess it self: and this may bee the form of the repercussives: Take of the juice of houf-leek, Purslain, Sorrel, Night-shade, of each two ounces; of Vineger one ounce, the whites of three egs, of oil of Roses and water-Lillies, of each two ounces and a half: stir them together, and applie it about the *Bubo*, and renew it often: or boil a Pomgranat in vineger, beat it with *Unguentum Rosatum*, or *Populeon* newly made, and applie it as is aforesaid. If these things do not stop the influx of other humors, the abscess it self and the places about it must bee scarified round about, if the part will permit it; that the part exonerated of portion of the venom may not stand in danger of the extinction of the proper and natural heat, by the greater quantitie and malignitie of the humors that flow unto it. In scarifying you must have care of the great vessels, for fear of an irrepugnable flux of blood, which in this case is verie hard to bee stayed or resisted; both becaus the part it self is greatly inflamed, and the humor verie fierce; for the expulsion whereof, nature, careful for the preservation of the part and all the bodie besides, seemeth to labor and work. But yet you must suffer so much of the blood and humor to flow out as the patient is able to abide without the loss of his strength. Moreover, you may spend forth the superfluous portion of the malignitie, with relaxing, mollifying, and resolving fomentations: as, Take the roots of Marsh-mallows, Lillies and Elecampane, of each one pound; of Lin-seeds and Fenugreek, of each one ounce; of Fennel-seeds and Anise-seeds, of each half an ounce; of the leavs of *Rue*, *Sage*, Rosemarie, of each one handfull, of Camomil and Melilot-flowrs, of each three handfuls; boil them all together, and make thereof a decoction for a fomentation; use it with a sponge according to Art. Also after the aforesaid scarification, wee may put Hens, or Turkies that lay egs (which therefore have their fundaments more wide and open, and for the same purpose put a little salt into their fundaments) upon the sharp top of the *Bubo*, that by shutting their *bills* at several times they may draw and suck the venom into their bodies, far more strongly and better then cupping-glasses, becaus they are endued with a natural propertie against poison, for they eat and concoct Toads, Etts, and such like virulent beasts: when one Hen is killed with the poison that shee hath drawn into her bodie, you must applie another, and then the third, fourth, fift and sixt within the space of half an hour. There bee som that will rather cut them, or elf use whelps cut asunder in the mid'st, and applied warm unto the place; that by the heat of the creature that is yet scarce dead, portion of the venom may bee dissipated and exhaled. But if nevertheless there bee anie fear of a Gangrene at hand, you must cut the flesh with a deeper scarification, not onely avoiding the greater vessels, but also the nervs, for fear of convulsion: and after the scarification and a sufficient flux of blood, you must wash it with *Ægyptiacum*, Treacle and Mithridate dissolved in sea-water, *aqua vitæ* and Vineger. For such a lotion hath virtue to stay putrefaction, repel the venom, and prohibit the blood from concretion: but if the Grangrene cannot bee avoided so, cauteries may bee applied to the part: especially actual, becaus they do more effectually repel the force of the poison, and strengthen the part. Presently after the impression of the hot iron, the Eschar must bee cut away even unto the quick-flesh, that the venemous vapors and the humors may have a free passage forth; for it is not to bee looked for that they will com forth of themselvs. With these inunctions they are wont to hasten the falling away of the Eschar. Take of the mucilage of marsh-mallows and Lin-seeds, of each two ounces; fresh butter, or Hog's-greas one ounce; the yelks of three eggs; incorporate them together, and make thereof an ointment: butter, Swines-greas, oil of Roses, with the yelks of eggs, perform the self same thing. When the Eschar is fallen away wee must use digestives. As take of the juice of Plantane, Water-Betonie, and Smallage, of each three ounces; honie of Roses four ounces; Venice-Turpentine five ounces; Barlie-flower three drams; Aloës two drams; oil of Roses four ounces; Treacle, half a dram: make a mundificative according to Art. Or, Take of Venice-Turpentine four ounces; syrup of dried Roses and Wormwood, of each an ounce; of the powder of Aloës, Mastich, Myrrh, Barlie-flower, of each one dram; of Mithridate half an ounce; incorporate them together. This unguent that followeth is verie meet for putrefied and corroding ulcers: Take

When repercussives may bee applied.

Why too much bleeding is to bee feared.

Liniments to hasten the falling away of the Eschar.

Against eating ulcers.

Take red Orpiment one ounce; of unquenched Lime, burnt Alum, Pomgranat-pills, of each six drams; of *Olibanum*, *Galls*, of each two drams; of Wax and Oil as much as shall suffice, make thereof an unguent. This doth mundifie strongly, consume putrefied flesh, and drie up virulent humidities that engender Gangrenes. But there is not a more excellent unguent then *Ægyptiacum* increased in strength, for besides manie other virtues that it hath, it doth consume and waste the proud flesh; for there is neither oil nor wax that goeth into the composition thereof, with which things the virtue of sharp medicines convenient for such ulcers, is delaied, and as it were dulled and hindered from their perfect operation so long as the ulcer is kept open. There have been manie that beeing diseased with this disease, have had much matter and venemous filth com out at their abscesses; so that it seemed sufficient, and they have bin thought well recovered, yet have they died suddenly. In the mean while when these things are in doing, cordial medicines are not to bee omitted to strengthen the heart. And purgations must bee renewed at certain seasons, that nature may bee everie waie unloaded of the burthen of the venenate humors.

The praif of *Ægyptiacum*.

CHAP. XXXII.

Of the Nature, Causses and Signes of a pestilent Carbuncle.

A Pestilent Carbuncle is a small tumor, or rather a malign pustle, hot and rageing, consisting of blood vitiated by the corruption of the proper substance. It often commeth to pass through the occasion of this untameable malignitie, that the Carbuncle cannot bee governed or contained within the dominion of nature. In the beginning it is scarce so big as a seed or grain of Millet or Peas, sticking firmly unto the part and immoveable, so that the skin cannot bee pulled from the flesh; but shortly after it increaseth like unto a *Bubo* unto a round and sharp head, with great heat, pricking pain, as if it were with needls, burning and intolerable, especially a little before night, and while the meat is in concocting, more then when it is perfectly concocted. In the midst thereof appeareth a bladder puffed up and filled with sanious matter. If you cut this bladder, you shall finde the flesh under it parched, burned and black; as if there had bin a burning cole laid there, whereby it seemeth that it took the name of Carbuncle; but the flesh that is about the place is like a Rain-Bow, of divers colours, as red, dark, geen, purple, livid, and black; but yet alwaies with a shineing blackness, like unto stone-pitch, or like unto the true precious stone which they call a *Carbuncle*, whereof som also say it took the name. Som call it a *Nail*, becaus it inferreth like pain as a nail driven into the flesh. There are manie Carbuncles which take their beginning with a crustie ulcer without a pustle, like to the burning of a hot iron: and these are of a black colour, they increas quickly, according to the condition of the matter whereof they are made. All pestilent Carbuncles have a Fever joined with them, and the grieved part seemeth to bee so heavie, as if it were covered or pressed with lead tied hard with a ligature. there commeth mortal swounings, faintings, tossing, turning, idle-talking, rageing, gangrens and mortifications; not onely to the part, but also to the whole bodie; by reason (as I think) of the oppression of the spirits of the part, and the suffocation of the naturall heat, as wee see also in manie that have a pestilent *Bubo*. For a *Bubo* and Carbuncle are tumors of a near affinitie, so that the one doth scarce com without the other, consisting of one kinde of matter, unless that which maketh the *Bubo* is more gross and clammie, and that which causseth the Carbuncle more sharp, burning and rageing, by reason of its greater subtiltie, so that it maketh an Eschar on the place where it is, as wee noted before.

What a Carbuncle is.

The signs of a Carbuncle.

When so called.

Symptoms of Carbuncles.

How the matter of a *Bubo* and Carbuncle differ.

CHAP. XXXIII.

What Prognosticks may bee made in pestilent Buboes and Carbuncles.

Som haveing the pestilence have but one Carbuncle, and som more in divers parts of their bodie, and in manie it happeneth that they have the *Bubo* and Carbuncle before they have anie Fever; which giveth better hope of health, if there bee no other malign accident therewith: for it is a sign that nature is the victor, and hath gotten the upper-hand, which excluded the pestilent venom before it could com to assault the heart. But if a Carbuncle and *Bubo* com after the Fever, it is mortal; for it is a token that the heart is affected, mooved and incensed with the furious rage of the venom; whereof presently commeth a feverish heat or burning, and corruption of the humors, sent as it were from the center unto the superficies of the bodie. It is a good sign when the patient's minde is not troubled from the beginning untill the seventh daie; but when the *Bubo* or Carbuncle sinketh down again shortly after that it is risen, it is a mortall sign, especially if ill accidents follow it. If after they are brought to suppuration they presently wax drie without anie reason thereof, it is an ill sign:

Why it is deadlie to have a sore com after the Fever.

Those

Thoſe Carbuncles that are generated of blood have a greater Eſchar then thoſe that are made of choler; becauſ that blood is of a groſs conſiſtence, and therefore occupieth a greater room in the fleſh: contrariwiſe, a cholerick humor is more ſmall in quantitie and thin, and it taketh little room in the vpper part of the fleſh onely, as you may ſee in an *Eryſipelas*. And I have ſeen Carbuncles whoſe Eſchars were as broad and as large as half the back: alſo I have ſeen others, which going up by the ſhoulders to the throat, did ſo eat away the fleſh that was under them, that the rough arterie or winde-pipe might bee ſeen bare, when the Eſchar was fallen away: I had once a Carbuncle which was in the midſt of my bellie, ſo that when the Eſchar was fallen away, I might verie plainly ſee the *Piritoneum* or Rim: and the cicatrice that remaineth is as broad as my hand: but they do not ſpread themſelvs ſo far without the great danger or death of the patient. There are alſo ſom Carbuncles which beginning at the parts under the chin, diſperſ themſelves by little and little unto the pattel-bones, and ſo ſtrangle the patient. So in manie, the *Buboes* in the groin ariſe above a great part of the muſcles of the *Epigaſtrium*. Truly of thoſe abſceſſes that are ſo large and great in quantitie, and ſo terrible to bee ſeen, there is great danger of death to the patient, or at leaſt to the grived part. For after the conſolidation, the part remaineth as if it were leprous, which aboliſheth the action of the part, as I have ſeen in manie. Oftentimes alſo the corruption of the matter is ſo great, that the fleſh leaveth the bones bare: but Carbuncles often leav the joints and ligaments quite reſolved through the occaſion of the moiſture that is ſoaked and ſunk in unto them; for they often caſt out putrefied and virulent ſanious matter: whereby eating and creeping ulcers are bred, manie bliſters and puſtles ariſing up in the parts round about it; which ſhortly breaking into one, make a great ulcer. Theſe com verie ſeldom and ſlowly unto ſuppuration, or at leaſt to caſt out laudable matter, eſpecially if they have their original of choler; becauſ the matter is ſooner burned with heat, then ſuppurated. Therefore then, if they can bee brought to ſuppuration by no medicines; if the tumor ſtill remain black; if when they are opened, nothing at all, or elſ a verie little ſharp moiſture doth com forth, they are altogether mortal; and there is ſcarce one of a thouſand who hath theſe accidents that recovereth health: diſperſed ſmall bliſters, comming of vapors ſtirred up by the matter that is under the skin, and are there ſtaied and kept from paſſage forth, do not neceſſarily fore-ſhew death in Carbuncles. But if the part bee ſwoln or puffed up, if it bee of a green or black color, and if it feel neither pricking nor burning, it is a ſign of a mortal Gangren. *Buboes* or Carbuncles ſeldom or never com without a Fever: but the Fever is more vehement when they are in the emunctories, or nervous parts, then when they are in the fleſhlie parts, yet it is leſs, and all Symptoms are leſs, and more tolerable in a man that is ſtrong and of a good temperature: Carbuncles not onely affect the outward, but alſo the inward parts, and oftentimes both together. If the heart bee vexed in ſuch ſort with a Carbuncle that nothing thereof appeareth forth on the ſuperficial parts, all hope of life is paſt, and thoſe die ſuddenly, eating, drinking or walking, and not thinking anie thing of death. If the Carbuncle bee in the middriff or lungs, they are ſoon ſuffocated: If it bee in the brain, the patient becommeth frantick, and ſo dieth. If it bee in the parts appointed for the paſſage of the urine, they die of the ſuppreſſion of their water, as it happened in the Queen-mother's waiting maide at the Caſtle of *Roſſillon*, of whom I ſpeak before. If it bee in the ſtomach, it inferreth the accidents that are ſhewed in this hiſtorie following.

Huge peſtilent Abſceſſes commonly deadlie.

Deadlie Carbuncles.

While I was Surgeon in the Hoſpital of Paris, a young and ſtrong Monk of the order of St. *Victor*, beeing overſeer of the woman that kept the ſick people of that place, fell into a continual Fever verie ſuddenly, with his tongue black, drie, rough, (by reaſon of the putrefied and corrupted humors, and the vapors riſing from the whole bodie unto that place) and hanging out like unto an hound's, with unquenchable thirſt, often ſwounding and deſire to vomit. Hee hath convulſions over all his bodie through the vehemencie and maligniti of the diſeaſ, and ſo hee died the third day: Wherefore thoſe that kept the ſick people in the Hoſpital, thought that hee had been poiſoned, for the certain knowledg whereof the Governors of the Hoſpital commanded his bodie to bee opened.

An hiſtorie.

I therefore calling to mee a Phyſician and Surgeon, wee found in the bottom of his ſtomach a print or impreſſion, as if it had been with an hot Iron or potential Cauterie, with an Eſchar or cruſt as broad as one's nail, all the reſt of his ſtomach was greatly contracted and ſhrunk up together, and as it were hornie; which wee conſidering, and eſpecially the Eſchar which was deep in the ſubſtance of the ſtomach, wee all ſaid with one voice that hee was poiſoned with *Sublimate* or Arſenick. But behold, while I was ſowing up his bellie, I perceived manie black ſpots diſperſed diverſly throughout the skin: then I asked my companie what they thought of thoſe ſpots; truly (ſaid I) it ſeemeth unto mee that they are like unto the purple ſpots or marks that are in the peſtilence. The Phyſician and the Surgeon denied it, and ſaid that they were the bitcings of fleas. But I perſwaded them to conſider the number of them over all the whole bodie, and alſo of their great depth and depreſſion into the fleſh; for when wee had thruſt needls deep into the fleſh in the middeſt of them, and ſo cut away the fleſh about the needle, wee found the fleſh about the needle to bee black: moreover his noſtrils, nails, and ears were livid, and all the conſtitution of his bodie was

How to diſtinguiſh purple ſpots from flea-biteings.

was contrarie, and far unlike to the bodies of those that died of other sicknesses or diseases. Also it was credibly reported unto us by those that kept him, that his face was so altered a little before hee died, that his familiar friends could hardly know him. Wee perswaded by these proofs, revoked our former opinion and sentence, and made a *Certificate* to bee sent unto the Governors and Masters of the Hospital, setting our hands and seals unto it, to certifie them that hee died of a pestilent Carbuncle.

CHAP. XXXIV.

Of the cure of a pestilent Carbuncle.

Why emplastick, verie hot, and great drawers are not good for a Carbuncle.

BY the fore-named signs of a pestilent Carbuncle, and especially by the bitternes of the pain, malignitie of the venemous matter, and by the burning fever that is therewithal annexed, I think it manifest, that verie hot, emplastick, and drawing medicines should not bee applied to this kinde of tumor; becaus they prohibit or hinder the exhalation, or wasteing forth of the venenate malignitie; becaus that by stopping the pores of the skin, they increas and caus a greater heat in the part then there was before. Therefore it is better to use resolving medicines, which may asswage heat, and resolv the pores of the skin. Therefore first the place must bee fomented with water and oil mixed together, wherein a little Treacle hath been dissolved, leaving thereon *stupes* wet therein: you may also use the decoction of Mallows, the roots of Lillies, Line-seeds, Figs, with oil of *Hypericon*, for to make the skin thin, and to draw forth the matter; and the day following you must applie the Cataplasm following.

A Cataplasm for a pestilent Carbuncle.

Another.

Take the leavs of Sorrel and Hen-bane, rost them under the hot ashes; afterwards beat them with four yelks of eggs, two drams of Treacle, oil of Lillies, three ounces; Barlie-meal as much as shall suffice: make thereof a Cataplasm in the form of a liquid *pultis*; this asswageth heat, and furthereth suppuration. Or, take the roots of Marsh-mallows and Lillies, of each four ounces; Line-seeds half an ounce; boil them, beat them, and then strain them through a cers, adding thereto of fresh butter one ounce and an half; of Mithridate one dram; of Barlie-meal as much as shall suffice: make thereof a Cataplasm according to art: those Cataplasms that follow are most effectual to draw the venemous matter forth, and to make a perfect suppuration, especially when the flux of the matter is not so great, but that the part may bear it. Take the roots of white Lillies, Onions, Leaven, of each half an ounce; Mustard-seeds, Pigeon's dung, Sope, of each one dram; six Snails in their shels; of fine Sugar, Treacle and Mithridate, of each half a dram; beat them altogether, and incorporate them with the yelks of eggs: make thereof a Cataplasm, and applie it warm. Or, take the yelks of six eggs; of salt powdered one ounce; of oil of Lillies and Treacle, of each half a dram; Barlie-meal as much as shall suffice: make thereof a Cataplasm. Take of ordinarie *Diachylon* four ounces; of *Unguentum Basilicon* two ounces; oil of Violets half an ounce: make thereof a medicine. Manie antient Professors greatly commend Scabious groun'd, or brayed between two stones, and mixed with old Hog's greas, the yelks of eggs, and a little salt; for it will caus suppuration in Carbuncles: also an egg mixed with Barlie-meal, and oil of Violets doth mitigate pain, and suppurate. A Raddish-root cut in slices, and so the slices laid one after one unto a Carbuncle or pestilent Tumor, doth mightily draw out the poison. The juice of Colt's-foot doth extinguish the heat of Carbuncles. The herb called Divel's-bit, beeing bruised, worketh the like effect. I have often used the medicine following unto the heat of Carbuncles, with verie good succes; it doth also asswage pain, and caus suppuration. Take of the soot scraped from a chimnie four ounces, of common salt two ounces; beat them into small powder, adding thereto the yelks of two eggs, and stir them well together until it com to have the consistence of a *pultis*, and let it bee applied warm unto the Carbuncle. In the beginning, the point or head of the Carbuncle must bee burned, if it bee black; by dropping thereinto scalding hot oil, or *aqua fortis*: for by such a burning the venom is suffocated, as touched by lightening, and the pain is much lessened, as I have prooved often times: neither is it to bee feared, lest that this burning should bee too painful, for it toucheth nothing but the point of the Carbuncle, which by reason of the Eschar that is there, is void of sens. After this burning, you must go forward with the former-described medicines, until the Eschar seemeth to separate it self from the flesh round about it, which is a token of the patient's recoverie; for it signifieth that nature is strong and able to resist the poison. After the fall of the Eschar you must use gentle mundificatives, as those which wee have prescribed in a pestilent *Bubo*; not omitting somtimes the use of suppurative and mollifying medicines, that while the gros matter is cleansed, that which is as yet crude may bee brought to suppuration: for then the indication is twofold; the one to suppurate that which remain's as yet crude and raw in the part, and the other to cleans that which remain's concocted and perfectly digested in the ulcer.

Other Cataplasms.

The effect of Scabious against a pestilent Carbuncle.

A Raddish root draw's out the venom powerfully.

The top of a Carbuncle, when, why, and with what to bee burned.

The falling of the Eschar promiseth health.

A twofold indication.

CHAP.

CHAP. XXXV.

Of the itching and inflammation happening in peſtilent ulcers, and how to cicatrize them.

THe parts adjoyning to a peſtilent Ulcer, oft-times are ſuperficiarily excoriated by reaſon of ulcerous puſtles, which here and there with burning and great itching prick and vellicate the part. The cauſ may happen either externally or internally; internally, by a thin and biteing *ſanies*, which ſweating from the Ulcer, moiſten's the neighboring parts. But externally by the conſtipation of the pores of the skin induced by the continual application of medicines. To remedie this, the place muſt bee fomented with diſcuſſing and relaxing things, as *aqua fortis*, which the Gold-ſmiths have uſed for ſeparateing of metals, Alum-water, the water of Lime, Brine, and the like. But Ulcers left by Carbuncles and peſtilent *Bubo's*, are difficultly cicatrized by reaſon of the corrodeing *ſanies*, proceeding from the cholerick, or phlegmatick and ſal't blood, which beeing in fault by the corruption of the whole ſubſtance cauſſeth the abſceſs. Beſides, ſuch Ulcers are commonly round, and therefore hard to bee cicatrized, for that the Quitture hath no free paſſage forth; ſo the *ſanies*, of its own nature acrid and corrodeing, doth by delaie acquire greater acrimonie and introſitie; ſo by its burning touch diſſolving the adjacent fleſh, it hinder's the conjunction and unition of the lips of the Ulcer: but in the *interim*, the lips of the Ulcer becom callous, which, unleſs they bee helped by cutting, or eating medicines, the Ulcer cannot bee healed; for that by their denſitie they hinder the ſweating out of a ſufficient quantitie of the dewie glue to heal up the Ulcer. Now the Ulcer beeing plained and brought equal to the other fleſh, wee muſt uſe Epuloticks, that is, ſuch things as have a faculti'e to cicatrize Ulcers by condenſing and hardening the ſurface of the fleſh: of theſe there are two kindes; for ſom without much biteing binde and drie: ſuch are Pomegranat-pills, Oak-bark, *Tutia*, Litharge, burn't bones, ſcales of braſs, Galls, Cypreſs-nuts, *Minium*, Antimonie, *Bole-Armenick*, the burn't and waſhed ſhels of Oiſters, Lime nine times waſhed, and manie metalline things. Others are next to theſe, by which proud fleſh is conſumed; but ſuch muſt bee ſpareingly uſed: of this kinde is waſhed Vitriol, burn't Alum, which excelleth other Epuloticks, by reaſon of the excellent drying and aſtringent faculti'e conſolidateing the fleſh, which by beeing moiſtened by an excrementitious humor, grow's lank. For that the ſcar which is made, is commonly unſightly in this kinde of Ulcers, as red, livid, black, ſwoln, rough, by reaſon of the great aduſtion imprinted in the part, as by a burning cole: therefore I have thought good here to ſet down ſom means, by which this deformitie may bee corrected or amended. If the ſcar bee too big, or high, it ſhall bee plained by makeing convenient ligation and ſtraight bindeing to the part a plate of lead rubbed over with Quick-ſilver; but you may whiten it, by annointing it with Lime nine times waſhed (that ſo it may bee more gentle, and loſe the acrimonie) and incorporated with oil of Roſes. Som take two pound of Tartar or Argole, burn it, and then powder it; put it in a cloth, and ſo let it hang in a moiſt Vault or Cellar, and ſet a veſſel under it to receiv the dropping of liquor, which is good to bee rubbed for a good ſpace upon the ſcar. The ſame faculti'e is thought to bee in that moiſture of eggs which ſweat's through the ſhell, whil'ſt they are roſted at the coles; as alſo *unguentum citrinum*, and *Emplaſt. de ceruſſâ* newly made. The three following compoſitions are much approoved. R. *Axungiæ ſuillæ nonies lotæ in aceto acerrimo* ℥iv. *cinab. ſucci titri, & alum. uſti, an.* ℥ß. *ſulphur. vivi ignem haud experti,* ʒii. *capb.* ℈ii. *fiat pulvis*; then let them all bee incorporated together, and make an ointment: it attenuate's the skin, and cleanſeth ſpots. R. *olei hyoſ. olei ſemin. cucurb. an.* ℥i. *olei tartar.* ℥ß. *ceræ alb.* ʒiii. *liquefiant ſimul lento igne; deinde adde ſpermat. ceti* ʒvi. *removeantur prædicta ab igne donec infrigid. poſtea adde troch. alb. Rhaſis pul.* ʒiii. *capb.* ʒi. *tandem cum mali cirei ſucco omnia diligenter commiſce, fiat linimentum.* Or elſ, R. *rad. ſerpent.* ℥i. *bulliat in aquâ com. lbi. ad dimid. deinde adde ſulph. vivi ignem non experti, & alum. crudi, pulveriſ. an.* ʒiß. *colent. prædicti. & addatur capb.* ʒi. *ſucci hyoſcyami* ʒiß. Let this medicine bee kept in a lead or glaſs-veſſel; and when you would uſe it, dip linnen cloaths therein, and lay them to the part. You may alſo uſe theſe medicines againſt the redneſs of the face; and you may fetch them off in the morning, by waſhing the face with warm water and bran.

Why the adjacent parts are troubled with itching.

A fomentation for this itch.

Why theſe Ulcers are hard to bee cicatrized.

Two ſorts of Epuloticks.

Remedies againſt the deformitie of ſcars.

Ointments to attenuate and take away ſcars.

CHAP. XXXVI.

Of ſundrie kindes of Evacuations, and firſt of Sweating and Vomiting.

THe peſtilent malignitie is not onely evacuated and ſent forth by the eruption of puſtles and ſpots, but alſo by ſweat, vomit, bleeding at noſe, at the *hæmorrhoids*, by the courſes, a flux of the bellie, and other waies; ſo that nature by everie kinde of excretion may bee free'd from the deadlie poiſon, eſpecially that which is not as yet arrived at the heart. But chief regard muſt bee had to the inclination of nature,

Why the peſtilent malignitie is not carried away by one way, but by manie.

Wee muſt have chief regard to the motion of nature.

ture, and wee muſt attend what way it chiefly aim's at, and what kinde of excretion it affect's. Yet ſuch evacuations are not alwaies critical, but uſually ſymptomatical; for that oft-times nature is ſo irritated by the untameable malignity of the matter, that it can no way digeſt it; but is forced by anie means to ſend it away crude as it is. Wherefore, if nature may ſeem by the moiſtneſs of the skin, the ſuppreſſion of urine, and other ſigns to affect a *criſis* and excretion by ſweat, you then ſhall procure it by the formerly mentioned means. It is delivered by the Antients, that all ſweats in acute diſeaſes are ſalutarie, which happen upon a critical day, which are univerſal and hot, and ſignified before the critical day. But in this rapid and deadlie diſeaſ of the Plague, wee muſt not expect a *Criſis*, but as ſoon as wee can, and by what means wee may, to free nature from ſo dire and potent an enemie.

Signs of future ſweat.

A *Criſis* muſt not bee expected in the Plague.

But oft-times the tough and groſs excrementitious humors may bee purged by vomit, which could not bee evacuated by ſtrong purges. Therefore alſo by this manner of excretion may wee hope for the excluſion of the peſtilent venom, if there bee nothing which may hinder; and nature by frequent nauſeouſneſs may ſeem to affect this way: the endeavor thereof ſhall bee helped by giveing ſom half a pinte of warm water to bee drunk with four ounces of common oil, an ounce of vineger, and a little juice of raddiſh: after the takeing of the potion, it is fit to thruſt into the throat a Gooſ-quill dipped in the ſame oil, or elſ a branch of Roſemarie; or elſ by thruſting in the fingers, ſo to procure vomit; alſo a potion of eight ounces of the mucilaginous water of the decoction of Line-ſeeds will procure vomit. Or elſ, R. *rad. rapb. in taleol. ſect. vel ſem. ejus, & ſem. antriplicis, an.* ℥iii. *bulliant in aquæ com. quod ſufficit pro doſi. in colaturâ diſſolve oxym. & ſyr. acet. an.* ℥ß *exhibeatur potio larga & tepida.* Or elſ, R. *oxym. Gal.* ℥vi. *ol. com.* ℥ii. *paretur potio tepid.* But nature muſt not bee forc't, unleſs of its own accord it undertake this motion; for forced and violent vomiting, diſtend's the nervous fibres of the ventricle, deject's the ſtrength, break's the veſſels of the lungs, whence proceed's a deadlie ſpitting of blood. Wherefore if the ſtomach ſhall trouble it ſelf with a vain and hurtful deſire to vomit, it ſhall rather bee ſtrengthened with bags of Roſes, Worm-wood, and Sanders, uſeing inwardly the juice of Quinces and Berberies, and broths made for the ſame purpoſe.

How to procure vomit.

Why vomit muſt not bee forced.

CHAP. XXXVII.

Of Spitting, Salivation, Sneeſing, Belching, Hicketting, and makeing of Water.

The effect of ſpitting in peſtilent diſeaſes.

THat long evacuations may bee made by Spitting and Salivation, you may learn by the example of ſuch as have a pluriſie; for the matter of the pluriſie beeing turned into *pus*, the purulent matter ſuck't up by the rare and ſpongeous ſubſtance of the lungs, and thence drawn into the *aſpera arteria*, is laſtly caſt out by the mouth.

The force of Salivation.

There is none ignorant, how much ſuch as have the *Lues Venerea* are helped by Salivation and Spitting. But theſe ſhall bee procured by Maſticatorie of the roots of *Ireos*, Pellitorie of Spain, Maſtich, and the like; the mucilage of Line-ſeeds held in the mouth will work the ſame effect.

The force of Sneeſing.

That ſuch as have a moiſt brain may expel their ſuperfluous humors by ſneeſing and blowing their noſes; the brain, by the ſtrength of the expulſive facultie, beeing ſtirred up to the excluſion of that which is harmful, may bee known by the example of old people and children which are daily purged by their noſes; the brain is ſtirred up to both kindes of excretion from cauſſes either internal or external: from the internal, as by a phlegmatick and vaporous matter, which contained in the brain, offend's it; externally, as by receiving the beams of the ſun in the noſtrils, or by tickling them with a feather, or blowing into them the powder of Hellebore, *Euphorbium*, *Pyrethrum*, Muſtard-ſeed, and the like ſternutamentories. For then the brain is ſtraightened by its own expulſive facultie, to the excretion of that which is troublous unto it. Sneeſing breaketh forth with noiſ, for that the matter paſſeth through ſtraights, to wit, by the ſtraining paſſages of the *Os cribroſum*, which is ſeated at the roots of the noſtrils. It is not fit to cauſ ſneeſing in a bodie verie plethorick, unleſs you have firſt premiſed general medicines, leſt the humors ſhould bee more powerfully drawn into the brain, and ſo cauſ an Apoplexie, *Vertigo*, or the like ſymptoms.

The commodities of Belching.

By Belching the flatulencies contained in the ventricle, beeing the off-ſpring of cruditie, or flatulent meats, are expelled; theſe by their taſte and ſmell, pleaſing, ſtinking, ſweet, bitter or tart, ſhew the condition and kinde of cruditie of the humors from whence they are raiſed: now vomiting free'th the ſtomach of crudities, but the diſtemper muſt bee corrected by contraries, as altering things to bee preſcribed by the Phyſician.

Hicketting is a contraction and extenſion of the nervous fibres of the ſtomach, to caſt forth ſuch things as are too contumaciouſly impact in the coats thereof, yet repletion onely is not the cauſ thereof, but ſomtimes inanition alſo; ſo oft-times a putrid vapor, from ſom other place, breaking into the ſtomach, as from a peſtilent *Bubo*, or Carbuncle; alſo all

acid

aicd and acrid things; becauſe they prick, vellicate and provoke the tunicles of the ventricle, as vineger, ſpiced things, and the like; often and contumacious hicketting after purgeing, a wound or vomiting is ill; but if a convulſion preſently happen thereon, it is deadlie.

Several remedies muſt bee uſed according to the varietie of the cauſſes: for repletion help's that hicketting that proceed's from inanition and evacuation, that which happen's by repletion: that which proceed's from a putrid and venemous vapor, is helped by Treacle and Antidotes; that which is occaſioned by acid and acrid things, is cured by the uſe of groſs, fattie, and cold things.

Now the whole bodie is oft-times purged by urine, and by this way the feveriſh matter is chiefly and properly accuſtomed to bee evacuated: not a few, beeing troubled with the *Lues Venerea*, when as they could not bee brought to ſalivation by unction, have been cured by the large evacuation of urine cauſſed by diuretick medicines. Diureticks, wherewithall you may moov urine, are formerly deſcribed in treating of the ſtone. But wee muſt abſtain from more acrid diureticks, eſpecially when as inflammation is in the bladder; for otherwiſe the noxious humors are ſent to the affected part, whence there is danger of a deadlie Gangrene. Therefore then it is better to uſe diverſion by ſweat.

The whole bodie purged by urine.

When wee ought to abſtain from diureticks.

CHAP. XXXVIII.

Of the Menſtrual *and* Hæmorrhoidal *purgation.*

NOt onely reaſon, but alſo manifold experience induceth us to beleev, that women, by the benefit of their menſtrual purgation, eſcape, and are free'd from great, peſtilent, and abſolutely deadlie diſeaſes; wherefore it muſt bee procured by remedies, both inwardly taken, and outwardly applied: theſe may bee taken inwardly with good ſucceſs, *Caſſia lignea*, Cinnamon, the *Bark* of the root of a Mulberrie, Safforn, Agrick, Nutmeg, Savine, *Diagridium*, and divers others. But if the affect require more vehement medicines, the roots of Tithymel, Antimonie, *Cantharides* (taken in ſmall quantitie) moov the courſes moſt powerfully; friction's and ligatures made upon the thighs and legs conduce hereto, as alſo cupping in the inner and middle part of the thighs, the opening of the vein *Saphena*, Leeches applied to the orifice of the neck of the womb, peſſaries, nodula's, glyſters, baths, fomentations made of oderiferous things, which by the fragrancie of their odor, or rather by their heat, may attenuate and cut groſs humors, open the obſtructed orifices of the veins; ſuch are the roots of Marſh-mallows, Orris, Parſlie, Fennel, Kneholn, the leavs and flowrs of Saint John's-wurt, *Aſparagus*, *Rocket*, Balm, Chervile, Mug-wurt, Mints, Pennie-royal, Savorie, Roſemarie, *Rue*, *Time*, *Sage*, Bay-berries, Broom, Ginger, Cloves, Pepper, Nutmegs, and the like; the vapor of the boiling whereof, let the woman, ſitting upon a perforated ſeat, receiv by a funnel into the neck of her womb, covering herſelf warm on all ſides, that ſo nothing may otherwiſe break forth. Of the ſame things may bee made baths, as well general, as particular. Alſo peſſaries are good made after this manner. R. *theriac. mithrid. an.* ʒſ. *caſtor. gum. ammoniac. an.* ʒi. *miſce cum bombace in ſucco mercurialis tincto, fiat peſſarium.* Or elſ, R. *rad. petroſelin. & fœnug. ſub cineribus cocta, deinde contuſas cum pul. ſtaphyſag. pyretb. croco & oleo liliorum*, ſo make a peſſarie in the form of a ſuppoſitorie or nodula. Or, R. *pulv. myrrh. & aloes, an.* ʒi. *fol. ſabin. nigel. artbewiſ. an* ʒii. *rad. Helleb. nigr.* ʒi. *croci*, ℈i. *cum ſucco mercur. & melle communi*: make a peſſarie in cotton. This which follow's is more effectual. R. *ſucci rut. abſinth. an.* ʒii. *myrrh. cupborb. caſtor. ſabin. diacrid. terebinth. galban. theriac. an.* ʒi. make a peſſarie according to art; let a thred hang out of the one end of the peſſaries, that ſo you may eaſily draw them forth as you pleaſ.

How to provoke the courſes.

How aromatick things provoke the courſes.

Peſſaries to provoke the terms.

But if this menſtruous flux one provoked, flow too immoderately, it muſt bee ſtopped by uſeing meats of groſſer and more viſcid juice, by opening a vein in the arm, application of cupping-glaſſes under the dugs, friction's and ligation's of the upper parts, as the arms, putting up of peſſaries, application of refrigerateing and aſtringent plaſters, to the lower bellie, *ſhare* and loins, laying the woman in a convenient place, and not upon a feather-bed.

How to ſtop the courſes flowing too immoderately.

This following injection ſtoppeth the blood flowing out of the womb. R. *aquæ plant. & fabror. an.* ℔i. *nucum cupreſ. gallar. immatur. an.* ʒii. *berber. ſumach. balauſt. vitriol. rom. alum. roch. an.* ʒii. *bulliant omnia ſimul, & fiat decoctio*: of this make injection into the womb. In the performance of all theſe things, I would have the Surgeon depend upon the advice of a Phyſician, as the occaſion and place ſhall permit.

But if nature endeavor to free it ſelf of the peſtilent matter by the *hæmorrhoides*, you may provoke them by friction's and ſtrong ligatures in the lower parts, as if the thighs or legs were broken, by *ventoſes* applied with great flame to the inner ſide of the thigh, by application of hot and attractive things to the fundament, ſuch as are fomentations, emplaſters, unguents; ſuch as is uſually made of an Onion roſted under the embers, and incorporated with Treacle, and a little oil of *Rue*: after the *hæmorrhoid* veins, by theſe means, com to ſhew themſelvs, they ſhall bee rubbed with rough linnen clothes, or Fig-leavs, or

How to provoke the *hæmorrhoids*.

or a raw Onion, or an Ox-gall mixt with som powder of *Colloquintida*. Lastly, you may aplie Horse-leeches, or you may open them with a lancet, if they hang much forth of the fundament, and bee swoln with much blood. But if they flow too immoderately, they may bee stai'd by the same means as the courses.

CHAP. XXXIX.

Of procureing evacuation by stool, or a flux of the bellie.

NAture often times, both by it self, of its own accord, as also helped by laxative and purgeing medicines, cast's into the bellie and guts, as into the sink of the bodie, the whole matter of a pestilent disease, whence are caused *Diarrhœa's*, *Lienteries*, and *Dysenteries*; you may distinguish these kindes of fluxes of the bellie, by the evacuated excrements. For if they bee thin and sincere, that is, retain the nature of one, and that a simple humor, as of choler, melancholie, or phlegm; and if they bee cast forth in a great quantitie, without the ulceration or excoriation of the guts, vehement, or fretting pain, then it is a *Diarrhœa*, which som also call *fluxus humoralis*. It is called a *Lienteria*, when as by the resolved retentive facultie of the stomach and guts caused by ill humors, either there collected, or flowing from som other place; or by a cold and moist distemper, the meat is cast forth crude, and almost as it was taken. A *Dysenteria* is, when as manie and different things, and oft-times mixt with blood, are cast forth with pain, gripeings, and an ulcer of the guts, caused by acrid choler, fretting insunder the coats of the vessels.

What a *Diarrhœa* is.

What a *Dysenteria* is.

But if in anie kinde of disease, certainly in a pestilent one, fluxes of the bellie happen immoderate in quantitie, and horrible in the qualitie of their contents, as liquid, viscous, frothie, as from melted greas, yellow, red, purple, green, ash-colored, black, and exceeding stinking. The caus is various, and manie sorts of ill humors, which taken hold of by the pestilent malignitie, turn into divers *species*, differing in their whole kinde both from their particular, as also from nature in general, by reason of the corruption of their proper substance, whose inseparable sign is stinch, which is oft-times accompanied by worms.

The caus of various and stinking excrements in the Plague.

In the camp at *Amiens*, a pestilent *Dysenterie* was over all the Camp, in this the strongest souldiers purged forth meer blood: I dissecting som of their dead bodies, observed the mouths of the *Mesaraick* veins and arteries, opened and much swollen; and whereas they entered into the guts, were just like little *Catyledones*, out of which as I pressed them, there flowed blood. For both by the excessive heat of the Summer's sun, and the mindes of the enraged souldiers, great quantitie of acrid and cholerick humor was generated, and so flowed into the bellie: but you shall know whether the greater or lesser guts bee ulcerated, better by the mixture of the blood with the excrements, then by the site of the pain; therefore in the one you must rather work by glysters; but in the other, by medicines taken by the mouth.

An historie.

Therefore, if by gripeings, a *tenesmus*, the murmuring and working of the guts, you suspect in a pestilent disease, that nature endeavor's to disburden it self by the lower parts, neither in the mean while doth it succeed to your desire, then must it bee helped forward by art, as by takeing a potion of ℥ß. of *biera simplex*, and a dram of *Diaphœnicon* dissolved in Worm-wood water.

A Potion.

Also Glysters are good in this case, not onely for that they asswage the gripeings and pains, & draw by continuation or succession from the whole bodie; but also becaus they free the *mesaraick* veins and guts from obstruction and stuffing; so that by opening, and as it were unlocking of the passages, nature may afterwards more freely free it self from the noxious humors. In such Glysters they also somtimes mix two or three drams of Treacle, that by one and the same labor they may retund the venenate malignitie of the matter.

There may also bee made for the same purpose Suppositories of boiled honie, ℥i. of *biera picra* and common salt, of each ℥ß. or that they may bee the stronger, of honie ℥iii. of Ox-gall ℥i. of Scammonie, *Euphorbium*, and *Coloquintida* powdred, of each ℥ß. The want of these may bee supplied by *Nodula's* made in this form. R. *vitell. ovor.* nu. iii. *fellis bubuli*, & *mellis*, *an.* ℥ß. *salis com.* ℥ß. let them bee stirred together, and well incorporated, and so parted into linnen rags, and then bound up into *Nodula's*, of the bigness of a Fil-berd, and so put up into the fundament; you may make them more acrid, by adding som powder of *Euphorbium*, or *Coloquintida*.

Suppositories.

CHAP. XL.

Of stopping the flux of the bellie.

VIolent and immoderate scourings, for that they resolv the facultie, and lead the patient into a consumption and death; therefore if they shall appear to bee such, they must bee

bee ſtaied in time by things taken and injected by the mouth and fundament. To this purpoſe may a pudding bee made of wheat-flowr boiled in the water of the decoction of one Pomegranat, Berberies, *Bole-Armenick*, *Terra ſigillata*, and white Poppie-ſeeds, of each ʒi. The following Almond-milk ſtrengthen's the ſtomach, and mitigate's the acrimonie of the cholerick humor, provoking the guts to excretion. Take ſweet Almonds boiled in the water of Barlie, wherein ſteel or iron hath been quenched; beat them in a marble-mortar, and ſo with ſom of the ſame water make them into an Almond-milk, whereto adding ʒi. of *Diarhodon Abbatis*, you may give it to the patient to drink. A haſtie pudding to ſtay the laſk.

This following medicine I learn't of Dr. *Chappelaine*, the King's chief Phyſician, who received it of his father, and held it as a great ſecret, and was wont to preſcribe it with happie ſucceſs to his patients. It is thus: ℞. *boli armen. terræ ſigil. lapid.hæmat. an.*ʒi. *picis navalis*, ʒiß. *coral rub.marg.electi.corn.cervi uſt. & loti in aq.plant. an.*ℨi. *ſaccar. roſ.*ʒii. *fiat pulviſc.* Of this let the patient take a ſpoonful before meat, or with the yelk of an egg. D. *Chappelain's* medicine to ſtay a ſcouring.

Chriſtopher Andrew in his *æcoiatria*, much commendeth dog's-dung, when as the dog hath for three daies before been fed onely with bones.

Quinces roſted in embers, or boiled in a pot, the *Conſerv* of Cornelian-cherries, *Preſerved* Berberies and Myrabalans, roſted nutmeg taken before meat, ſtrengthen the ſtomach, and ſtay the laſk; the patient muſt feed upon good meats, and theſe rather roſted then boiled. His drink ſhall bee *calibeate*-water of the decoction of a ſowr Pomegranat beaten, or of the decoction of a Quince, Medlars, Cervices, Mulberries, Bramble-berries, and the like things, endued with a facultie to binde and waſte the excrementitious humidities of the bodie: theſe waters ſhall bee mixed with ſyrup of red Currants, julip of Roſes, and the like. Drink.

Let the region of the ſtomach and bellie bee annointed with oil of Maſtich, *Moſchatelinum*, Myrtles, and Quinces. Alſo a cruſt of bread newly drawn forth of the oven, and ſteeped in vineger and Roſe-water, may bee profitably applied; or elſe a cataplaſm of red Roſes, Sumach, Berberies, Myrtles, the pulp of Quinces, Maſtich, Bean-flowr, and honie of Roſes made up with *calibeate*-water. Ointments.

Anodyne, abſtergent, aſtringent, conſolidateing and nouriſhing glyſters ſhall bee injected. Theſe following retund the acrimonie of humors, and aſſwage pain. ℞. *ſol.lactuc. hyoſc. acetoſ.portul.an* m.i. *flor.violar. & nenuph. an.*ʒiß. *fiat clyſter.* Or elſe, ℞. *roſ.rub. bord. mund. ſem.plant. an.*p.i. *fiat decoctio, in colaturâ adde olei roſ.*ʒii. *vitel.ovor.*ii. *fiat clyſter.* Or, ℞. *decoctionis capi, crur. vitellin. & capit. vervicin. unà cum pelle,* ℔.ii. *in quâ coquantur fol.violar. malv. mercur. plantag. an.* m.i. *bord.mund.*ʒi. *quatuor ſem. frigid.major. an.*ʒß. *in colaturæ* ℔ß. *diſſolve caſſ.recenter extract.* ʒi. *ol.viol.*ʒiv. *vitellor.ovor.*ii. *ſacc.rub.*ʒi. *fiat clyſter.* Or, ℞. *flor. chamæm. melil. anetb. an.*p.i. *rad.biſmal.*ʒi. *fiat decoctio in lactæ; colaturæ adde mucag.ſem.lin.fænagr.extract. in aquâ malv.*ʒii. *ſaccar.rub.* ʒi. *olei cham. & anetb. an.*ʒiß. *vitellor.ovor.*ii. *fiat clyſter.* Glyſter to ſtay a flux.

Such glyſters muſt bee long kept, that they may more readily mitigate pain. When ſhaveings of the guts appear in the ſtools, it is an argument that there is an ulcer in the guts; therefore then wee muſt uſe detergent and conſolidateing glyſters, as this which follow's.

℞. *bordei integr.*p.ii. *roſ.rub.flor.chamæm.plantag.apii, an.*p.i. *fiat decoctio, in colaturâ diſſolve mellis roſat. & ſyr.de abſinth.an* ʒiß. *vitel.ovor.*ii. This following glyſter conſolidateth. ℞. *ſucci plantag.centinod. & portulac.*nu.ʒii. *bol armen.ſang. dracon. amyl.an.*ʒi. *ſebi hircini diſſoluti,* ʒiii. *fiat clyſter.* Alſo Cow's-milk boiled with Plantain, and mixed with ſyrup of Roſes, is an excellent medicine for the ulcerated guts. A glyſter for ulcerated guts.

This following glyſter binde's. ℞. *cand.equin. plant.polygon. an.*m.i. *fiat decoctio in lactæ uſtulato ad* quart.iii. *& in colaturâ adde boli armen.ſigil.ſang.dracon.an.*ʒii. *albumina duor. ovor. fiat clyſter.* Or elſe, ℞. *ſuc.plant.arnogloſ.centinod.portulac.reſidentia facta depuratorum quantum ſufficit pro clyſtere, addendo pul. boli armeni, terræ ſigil.ſang.dracon.an.*ʒi. *ol.myrtbin. & roſat.an.*ʒii. *fiat clyſter.* A verie aſtringent glyſter.

If pure blood flow forth of the guts, I could wiſh you to uſe ſtronger aſtrictives. To which purpoſe I much commend a decoction of Pomegranat-pills, of Cypreſs-nuts, red Roſe leavs, Sumach, and Alum, and Vitriol made with Smith's water; and ſo made into glyſters, without anie oil. It will bee good with the ſame decoction to foment the fundament, *perinæum*, and the whole bellie.

Aſtringent glyſters ought not to bee uſed before that the noxious humors bee drawn away, and purged by purgeing medicines, otherwiſe by the ſtoppage hereof, the bodie may chance to bee oppreſſed.

If the patient bee ſo weak, that hee cannot take or ſwallow anie thing by mouth, nutritive glyſters ſhall bee given him. ℞. *decoctionis capi pinguis, & crur. vitulini, coct.cum acetoſâ, buglоſſo, boragine, pimpinellâ, lactucâ,* ℥x. *vel* xii. *in quibus diſſolve vitellos ovorum,* nu.iii. *ſaccari roſati, & aquæ vitæ, an.*ʒi. *butyri recentis non ſaliti,* ʒii *fiat clyſter.* A nouriſhing glyſter.

CHAP. XLI.

Of evacuation by insensible transpiration.

THe pestilent malignitie, as it is oftimes drawn by the pores, by transpiration into the bodie, so oftimes it is sent forth invisibly the same way again. For our native heat, that is never idle in us, disperseth the noxious humors, attenuated into vapors and air through the unperceivable breathing-places of the skin. An argument hereof is, wee see that the tumors and abscesses against nature, even when they are com to suppuration, are oftimes resolved and discussed by the onely efficacie of nature, and heat, without anie help of art. Therefore there is no doubt, but that nature, beeing prevalent, may free it self from the pestilent malignitie by transpiration, som Abscess, *Bubo*, or Carbuncle beeing com forth, and som matter collected in som certain part of the bodie. For when as nature and the native heat are powerful and strong, nothing is impossible to it, especially when the passages are also in like manner free and open.

Tumors are oftimes discussed by the force of nature after they are suppurated.

CHAP. XLII.

How to cure Infants and Children taken with the Plague.

IF that it happen that sucking or weaned children bee infected with the pestilence, they must bee cured after another order then is yet described. The Nurse of the sucking childe must govern her self so in diet and the use of medicines, as if shee were infected with the pestilence her self: Her diet consisteth in the use of the six things *not natural*. Therefore let it bee moderate; for the fruit or profit of that moderation in diet cannot chuse but com unto the Nurses milk, and so unto the Infant that liveth by the milk. And the Infant it self must keep the same diet as near as hee can in sleep, wakeing, and expulsion, or avoiding of superfluous humors and excrements of the bodie. Let the Nurse bee fed with those things that mitigate the violence of the feverish heat: as cooling broths, cooling herbs, and meats of a moderate temperature: shee must wholly abstain from wine, and annoint her nipples, as often as shee giveth the Infant suck, with water, or juice of Sorrel, tempered with Sugar of Roses. But the Infants heart must bee fortified against the violence of the increasing venom, by giveing it one scruple of Treacle in the Nurse's milk, the broth of a Pullet, or som other cordial water. It is also verie necessarie to annoint the region of the heart, the emunctories, and both the wrists with the same medicine: neither were it unprofitable to smell often unto Treacle dissolved in Rose-water, vineger of Roses, and a little *Aqua vitæ*, that so nature may bee strengthened against the malignitie of the venom. When the children are weaned, and somwhat well grown, they may take medicines by the mouth; for when they are able to concoct and turn into blood meats that are more gross and firm then milk, they may easily actuate a gentle medicine. Therefore a potion must bee prepared for them of twelv grains of Treacle, dissolved with a little of the syrup of Succorie in som cordial water, or the broth of a Capon: unless that anie had rather give it with *Conserv* of Roses, in form of a bole: but Treacle must bee given to children in verie small quantitie, for if it bee taken in anie large quantitie, there is great danger, lest that by inflameing the humors, it infer a fever. Furthermore, broth may bee prepared to bee taken often, made of a Capon seasoned with Sorrel, Lettuce, Purslain and cooling seeds, adding thereto *Bole-Armenick*, and *Terra sigillata*, of each one ounce, beeing tied in a rag, and somtimes pressed out from the decoction. For *Bole-Armenick*, whether it bee by its marvellous facultie of drying, or by som hidden propertie, hath this virtue, that beeing drunken (according as *Galen* witnesseth) it cureth those that are infected with the pestilence, if so bee that they may bee cured by physick; so that those that cannot bee cured with *Bole-Armenick*, cannot bee preserved by anie other medicines. But becaus the bodies of children are warm, moist and vaporous, they are easily delivered of som portion of the venenate matter through the pores of the skin by provokeing sweat, with a decoction of Parslie-seeds, Prunes, Figs, and the roots of Sorrel, with a little of the powder of Hart's-horn, or Ivorie. But that the sweat may bee more abundant and copious, applie sponges dipped and pressed out in the hot decoction of *Sage*, Rosemarie, Lavender, Bays, Cammomil, Melilot and Mallows, or elsSwine's bladders half filled with the same decoction, to the arm-holes, and to the groins. In the time that they sweat, let their faces bee fanned to cool them. Also let a nodule of Treacle, dissolved in vineger and water of Roses, bee applied to the nostrils; but alwaies use a moderation in sweating, becaus that children are of a substance that is easie to bee dissipated and resolved: so that oftentimes although they do not sweat, yet they feel the commodities

The nurse must bee dieted when as the childe is sick.

Medicines may bee given to such as are weaned.

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The benefit of children.

modities of ſweating, the matter of the venom beeing diſſipated by the force of the heat through the pores of the skin. But in the ſweating, while the face is fanned, and ſweet and cordial things applied to the noſtrils, nature muſt bee recreated and ſtrengthened, which otherwiſe would bee debilitated through ſweating, that it may bee better able to expel the venom. After that the ſweat is wiped away, it is verie profitable to take a potion of *Conſerv* of Roſes, with the powder of Hart's-horn, or of Ivorie diſſolved in the waters of Bugloſs and Sorrel, the better to cool and defend the heart. If there appear anie tumor under the arm-holes, or in the groin, let it bee brought to maturation with a mollifying, relaxing, drawing, and then with a ſuppurative fomentation, or cataplaſm; alwaies uſeing and handling it as gently as you may, conſidering the tender age of the Infant. If you have need to purge the patient, the purgation following may bee preſcribed with great profit. Take of Rubarb in powder one dram; infuſe it in the water of *Carduus Benedictus*, with one ſcruple of Cinnamon; in the ſtraining diſſolv two drams of *Diacatholicon*; of ſyrup of Roſes laxative three drams; make thereof a ſmall potion. This is the cure of the Peſtilence, and of the peſtilent Fever, as far as I could learn from the moſt learned Phyſicians, and have obſerved my ſelf by manifold experience by the grace and permiſſion of God:

The form of a purge to bee given to a childe.

of whom alone, as the Autor of all good things that mortal men enjoy,
the true and certain preſervatives againſt the Peſtilence, are
to bee deſired and hoped for.

The end of the twentie ſecond Book.

OF

Of the Means and Manner to repair or ſupplie the natural or accidental defects or wants in Man's bodie.

The twentie third Book.

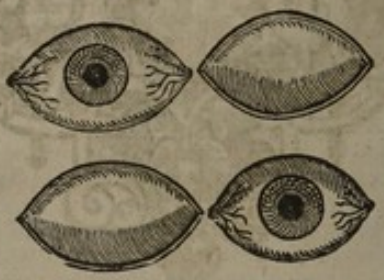
CHAP. I.

How the loſs of the natural or true eie may bee covered, hidden or ſhadowed.

The fourth dutie of a Surgeon.

HAveing at large treated in the former Books of Tumors, Wounds, Ulcers, Fractures and Luxations, by what means things diſſolved and diſlocated might bee united, things united ſeparated, and ſuperfluities conſumed or abated: Now it remain's, that wee ſpeak of the fourth office or dutie of the Chirurgion, which is to ſupplie or repair thoſe things that are wanting by nature, through the default of the firſt conformation, or afterwards by ſom miſchance. Therefore, if that through anie miſchance, as by anie inflammation, anie man's eie happen to bee broken or put out, and the humors ſpilt or waſted; or if it bee ſtrucken out of his place or cavitie wherein it was naturally placed by anie violent ſtroke; or if it waſte or conſume by reaſon of a conſumption of the proper ſubſtance, then there is no hope to reſtore the ſight or function of the eie, yet you may cover the deformitie of the eie ſo loſt (which is all you can do in ſuch a caſe) by this means: If that when you have perfectly cured and healed the ulcer, you may put another eie artificially made of gold or ſilver, counterfeited and enamelled, ſo that it may ſeem to have the brightneſs, or gemmie decencie of the natural eie, into the place of the eie that is ſo loſt.

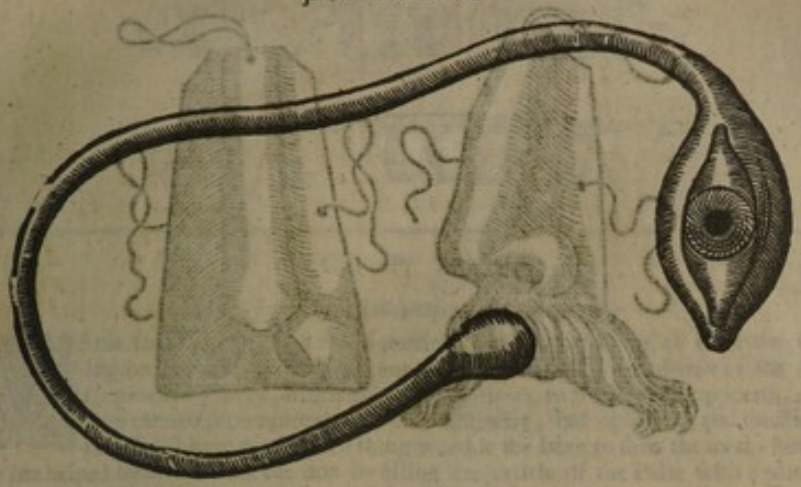
The forms of eies artificially made of gold or ſilver, poliſhed and enameled, ſhewing both the inner and outer ſide.



But if the patient bee unwilling, or by reaſon of ſom other means cannot wear this eie ſo prepared, in his head; you may make another on this wiſe. You muſt have a ſtring or wier of iron bowed or crooked, like unto women's ear-wiers, made to binde the head harder or looſer, as it pleaſeth the patient, from the lower part of the head behinde above the ear, unto the greater corner of the eie; this rod or wier muſt bee covered with ſilk; and it muſt alſo bee ſomwhat broad at both ends, leſt that the ſharpneſs thereof ſhould pierce or prick anie part that it commeth unto. But that end wherewith the emptie hollowneſs muſt bee covered, ought to bee broader then the other, and covered with a thin piece of leather, that thereon the colors of the eie that is loſt may bee ſhadowed or counterfeited. Here followeth the figure or portraiture of ſuch a ſtring or wier.

The

The form of an iron wier wherewith the deformitie of an eie that is loſt may bee ſhadowed or covered.



CHAP. II.

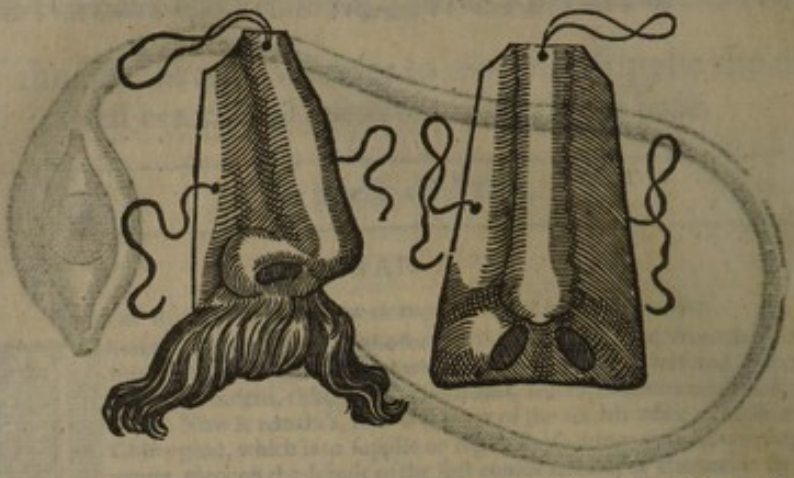
By what means a part of the Noſe that is cut off, may bee reſtored; or how in ſtead of the noſe that is cut off, another counterfeit noſe may bee faſtened, or placed in the ſtead.

WHen the whole Noſe is cut off from the face, or portion of the noſtrils, from the Noſe, it cannot bee reſtored or joyned again; for it is not in men, as it is in plants. For plants have a weak and feeble heat; and furthermore, it is equally diſperſed into all the ſubſtance of the plant or tree, neither is it eaſie to bee conſumed or waſted: for when the boughs or branches of trees are broken, torn, or cut away, they live nevertheleſs, and will grow again when they are ſet and grafted; neither is there anie ſeat for the heart rightly prepared in them from whence the heat muſt neceſſarily run, and diſperſ it ſelf continually into all the parts thereof. But contrariwiſe, the ſeparated parts of more perfect living creatures, as of men, are incontinently deprived of life; becauſ they have their nouriſhment, life, ſenſ, and whole ſuſtentation not of themſelvs, by faculties flowing or comming unto them from ſom other parts; neither are they governed by their own heat, as plants, but by a borrowed heat: ſo that above or beſide the natural facultie of the liver, another vital facultie commeth unto it from the heart.

Why the parts of plants beeing cut off, may grow again, but thoſe of man cannot.

Wherefore in ſtead of the Noſe cut away or conſumed, it is requiſite to ſubſtitute another made by art; becauſ that nature cannot ſupplie that defect: this Noſe ſo artificially made, muſt bee of gold, ſilver, paper, or linnen clothes glewed together, it muſt bee ſo colored, counterfeited, and made both of faſhion, figure and bigneſs, that it may as aptly as is poſſible, reſemble the natural Noſe: it muſt bee bound or ſtayed with little threds or laces unto the hinder part part of the head or the hat. Alſo if there bee anie portion of the upper lip cut off with the noſe, you may ſhadow it with annexing ſom ſuch thing that is wanting unto the noſe, and cover it with the hair on his upper lip, that hee may not want anie thing that may adorn or beautifie the face. Therefore I have thought it neceſſarie to ſet down the figure or form of both theſe kindes.

The form of a noſe artificially made, both alone by it ſelf, and alſo with the upper-lip covered as it were with the hair of the beard.



A ſtrange cure for a cut-off noſe.

There was a Surgeon of Italie of late years which would reſtore or repair the portion of the noſe that was cut away after this manner. Hee firſt ſcarified the callous edges of the maimed noſe round about, as is uſually don in the cure of hare-lips: then hee made a gaſh or cavitie in the muſcle of the arm, which is called *Biceps*, as large as the greatneſs of the portion of the noſe which was cut away did require: and into that gaſh or cavitie ſo made, hee would put that part of the noſe ſo wounded, and binde the patient's head to his arm, as if it were to a poſt, ſo faſt that it might remain firm, ſtable and immoveable, and not lean or bow anie way; and about fortie daies after, or at that time when hee judged the fleſh of the noſe was perfectly agglutinated with the fleſh of the arm; hee cut out as much of the fleſh of the arm, cleaving faſt unto the noſe, as was ſufficient to ſupplie the defect of that which was loſt, and then hee would make it even, and bring it, as by licking, to the faſhion and form of a noſe, as near as art would permit; and in the mean while hee did feed his patient with panadoes, gellies and all ſuch things as were eaſie to bee ſwallowed and digeſted. And hee did this work of cureing the place where the fleſh was ſo cut out, onely with certain balms and agglutinative liquors. A younger brother of the familie of St. *Thuan*, beeing wearie of a ſilver-noſe, which beeing artificially made, hee had worn in the place of his noſe that was cut off, went to this Chirurgian into Italie, and by the mean fore-named practice hee recovered a noſe of fleſh again, to the great admiration of all thoſe that knew him before. This thing truly is poſſible to bee don, cut it is verie difficult both to the patient ſuffering, and alſo to the Chirurgian working. For that the fleſh that is taken out of the arm is not of the like temperature as the fleſh of the noſe is; alſo the holes of the reſtored noſe cannot bee made as the were before.

An hiſtorie.

CHAP. III.

Of the placeing of Teeth artificially made in ſtead of thoſe that are loſt or wanting.

IT oftentimes happeneth that the fore-teeth are mooved, broken or ſtricken out of their places by ſom violent blow, which cauſſeth deformitie of the mouth, and hinder's plain pronunciation. Therefore when the jaw is reſtored (if it were luxated or fractured) and the gums brought into their former hardneſs; other teeth artificially made of bone or Ivorie may bee put in the place of thoſe that are wanting, and they muſt bee joined one faſt unto another, and alſo ſo faſtned unto the natural teeth adjoining, that are whole; and this muſt chiefly bee don with a thred of gold or ſilver, or for want of either, with a common thred of ſilk or flax, as it is declared at large by *Hippocrates*, and alſo deſcribed in this figure following.

Sect. 2. lib. de art. ſect. 25.

The figure of Teeth bound or fastned together.

CHAP. IIII.

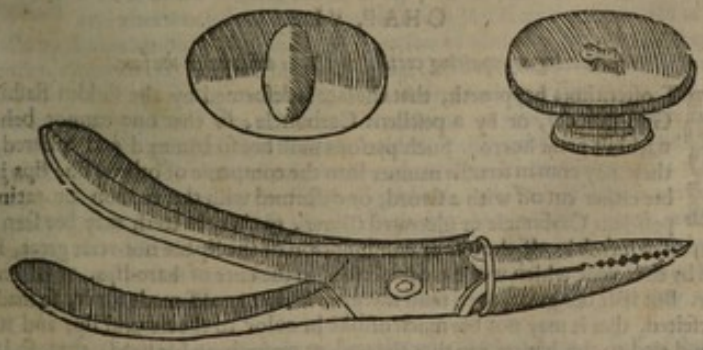
Of filling the hollowness of the Palat.

MAnie times it happeneth that a portion or part of the bone of the Palat, bee-ing broken with the shot of a gun, or corroded by the virulencie of the *Lues Venerea*, fall's away, which make's the patients, to whom this happeneth, that they cannot pronounce their words distinctly, but obscurely, and snuffling: therefore I have thought it a thing worthie the labor to shew the means how it may bee helped by art. It must bee don by filling the cavitie of the Palat with a plate of gold or silver, a little bigger then the cavitie it self is. But it must bee as thick as a French Crown, and made like unto a dish in figure; and on the upper side, which shall bee towards the brain, a little sponge must bee fastened, which, when it is moistened with the moisture distilling from the brain, will becom more swoln, and puffed up; so that it will fill the concavitie of the Palat, that the artificial Palat cannot fall down, but stand fast and firm, as if it stood of it self. This is the true figure of those instruments, whose certain use I have observed not by once or twice, but by manifold trials in the battels fought beyond the Alps.

The causes and hurt that ensue's of the lost palat.

The figure of plates to fill or supplie the defects of the Palat.

The figure of another plate for the Palat, on whose upper side there is a button, which may bee turned when it is put into the place, with a small Raven's bill, like this whose figure is here expressed.



CHAP.

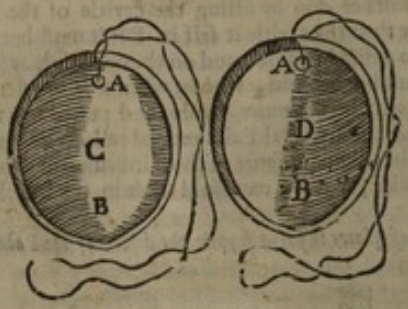
CHAP. V.

How to help ſuch as cannot ſpeak by reaſon of the loſs of ſom part of the tongue.

A remedie found out by accident. An hiſtorie.

CHance gave place and autoritie to this remedie, as to manie other in our Art. A certain man dwelling in a villa e named *Troy le Cheſteau*, beeing ſom twentie four miles from *Bourges*, had a great piece of his tongue cut off; by which occaſion hee remain'd dumb ſom three years. It happen'd on a time that as hee was in the fields with reapers, hee drinking in a wooden diſh, was tickled by ſom of the ſtanders by, not endureing the tickling, hee ſuddenly broke out into articula te and intelligible words. Hee himſelf wondring thereat, and delighted with the noveltie of the thing, as a miracle, put the ſame diſh to his mouth juſt in the ſame manner as before, and then hee ſpake ſo plainly and articulately, that hee might bee underſtood by them all. Wherefore a long time following hee alwaies carried this diſh in his boſom, to utter his minde, until at length neceſſitie, the miſtreſs of arts, and giver of wit induceing him, hee cauſſed a wooden inſtrument to bee neatly cut and made for him, like the which is here delineated, which hee alwaies carried hanging at his neck, as the onely interpreter of his minde, and the key of his ſpeech.

An inſtrument made to ſupplie the defect of the ſpeech when the tongue is cut off.



The uſe of the Inſtrument is this.

A. ſheweth the upper part of it which was of the thickneſs of a nine-pence, which hee did ſo hold between his cutting teeth, that it could not com out of his mouth nor bee ſeen. B. ſheweth the lower part, as thick as a ſix-pence, which hee did put hard to the reſt of his tongue, cloſe to the membranous ligament which is under the tongue. That place which is depreſt and ſomwhat hollowed, marked with the letter C. is the inner part of the inſtrument. D. ſheweth the outſide of the ſame. Hee hanged it about his neck with the ſtring that is tied thereto.

Textor the Phyſician of Bourges ſhewed mee this inſtrument: and I my ſelf made trial thereof on a young man whoſe tongue was cut off, and it ſucceeded well, and took verie good effect. And I think other Surgeons in ſuch caſes may do the like.

CHAP. VI.

Of covering or repairing certain defects or defaults in the face.

IT oftentimes happeneth, that the face is deformed by the ſudden flaſhing of Gun-powder, or by a peſtilent Carbuncle, ſo that one cannot behold it without great horror. Such perſons muſt bee ſo trimmed and ordered, that they may com in ſeemlie manner into the companie of others. The lips if they bee either cut off with a ſword, or deformed with the erolion or eating of a peſtilent Carbuncle or ulcerated *Cancer*, ſo that the teeth may bee ſeen to lie bare with great deformitie. If the loſs or conſumption of the lip bee not verie great, it may bee repaired by that waie which wee have preſcribed in the cure of hare-lips, or of an ulcerated *Cancer*. But if it bee great, then muſt there bee a lip of gold made for it, ſo ſhadowed and counterfeited, that it may not bee much unlike in color to the natural lip, and it muſt bee faſtned and tied to the hat or cap that the patient weareth on his head, that ſo it may remain ſtable and firm.

CHAP. VII.

Of the defects of the Ears.

SUch as want their Ears, either naturally or by misfortune, as through a wound, carbuncle, cancer, or the biteing of wilde beasts: if ſo bee that the Ear bee not wholly wanting, wasted, conſumed, or torn away; but that ſom portion thereof doth yet remain, then muſt it not bee neglected, but muſt have manie holes made therein with a bodkin; and after that the holes are cicatrized, let ſom convenient thing, made like unto the piece of the Ear that is loſt, bee tied or faſtned unto it by theſe holes.

But if the Ear bee wholly wanting, another muſt bee made of paper artificially glewed together, or elſ of leather, and ſo faſtened with laces, from the top or hinder part of the head, that it may ſtand in the appointed place; and ſo the hair muſt bee permitted to grow long, or elſ ſom cap worn under the hat, which may hide or cover the deformitie, unleſs you had rather have it to bee ſhadowed or counterfeited by ſom Painter, that thereby it may reſemble the color of a natural Ear; and ſo retain in it the place where it ought to ſtand, with a rod or wier comming from the top or hinder part of the head, as wee have ſpoken before in the loſs of the Eie; and the form thereof is this.

CHAP. VIII.

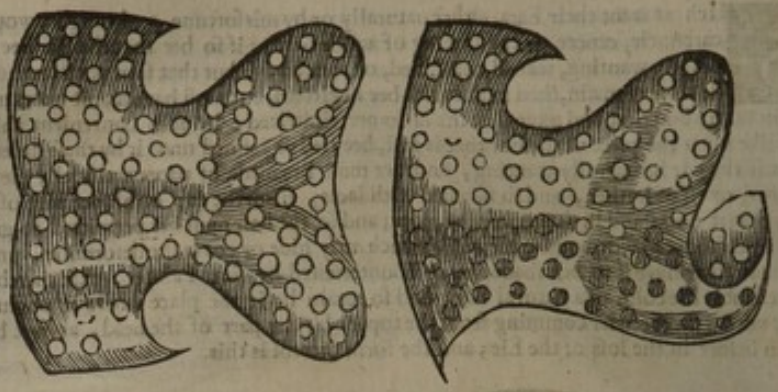
Of amending the deformitie of ſuch as are crook-back't.

THe bodies of manie, eſpecially young maids or girls (by reaſon that they are more moiſt and tender then the bodies of boys) are made crooked in proceſs of time, eſpecially by the wrenching aſide and crookedneſs of the back-bone. It hath manie cauſſes, that is to ſay, in the firſt conformation in the womb, and afterwards by misfortune; as a fall, bruiſ, or anie ſuch like accident; but eſpecially by the unhandſom and undecent ſituation of their bodies, when they are young and tender, either in carrying, ſitting or ſtanding (and eſpecially, when they are taught to go too ſoon) ſaluting, ſewing, writeing, or in doing anie ſuch like thing. Cauſſes of crookedneſs.

In the mean while, that I may not omit the occaſion of crookedneſs, that happen's ſeldom to the Countrie-people, but is much incident to the inhabitants of great Towns and Cities, which is by reaſon of the ſtraightneſs and narrowneſs of the garments that are worn by them, which is occaſioned by the follie of mothers, who while they covet to have their young daughters bodies ſo ſmall in the middle as may bee poſſible, pluck and draw their bones awrie, and make them crooked. For the ligaments of the back-bone beeing verie tender, ſoft and moiſt at that age, cannot ſtay it ſtraight, and ſtrongly; but beeing pliant, eaſily permit's the ſpondels to ſlip awrie inwards, outwards, or ſide-wiſe, as they are thruſt or forced.

The remedie for this deformitie is to have breaſt-plates of iron, full of holes all over them, whereby they may bee lighter to wear; and they muſt bee ſo lined with bombaſte, that they may hurt no place of the bodie. Everie three months new plates muſt bee made for thoſe that are not yet arrived at their full growth; for otherwiſe by the dailie afflux of more matter, they would becom worſ. But theſe plates will do them ſmall good that are alreadie at their full growth.

The form of an iron Breaſt-plate, to amend the crookedneſs of the Bodie.



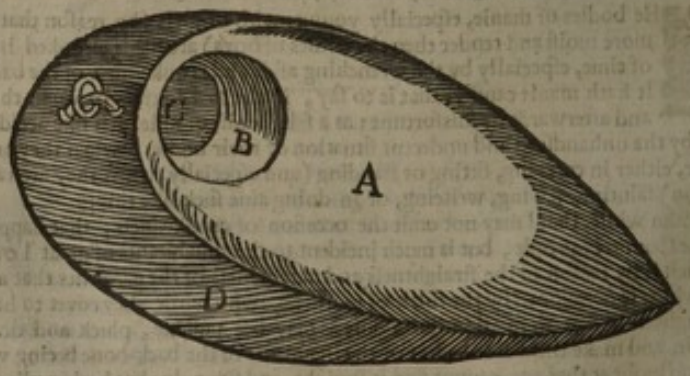
CHAP. IX.

How to reliev ſuch as have their urine flow from them againſt their wils, and ſuch as want their yards.

An inſtrument for ſuch as cannot hold their water.

IN thoſe that have the Strangurie, of what cauſ ſoever that maladie cometh, the urine paſſeth from them by drops, againſt their wils and conſent. This accident is verie grievous and troubleſom, eſpecially to men that travell: and for their ſakes onely I have invented the inſtrument here beneath deſcribed. It is made like unto a cloſe breech or hoſe; it muſt bee of latin, and to contain ſom four ounces: it muſt bee put into the patient's hoſe, between his thighs, unto which it muſt bee tied with a point by the ring. Into the open and hollow mouth of this inſtrument, which is noted with the letter C. the patient muſt put his yard; and into this concavitie or hollowneſs goeth a ſtay ſomwhat deep, it is marked with the letter B. and made or placed there, both to hold or bear the end of the yard, and alſo by his cloſe joint that it muſt have unto the veſſel, to ſtay the urine from going back again, when it is once in. But the letters A. and D. do ſignifie all the inſtrument; that the former part, and this the hinder part thereof. Now this is the ſhape thereof.

The figure of an Inſtrument, which you may call, A Baſin, *or Receptacle for the Urine.*

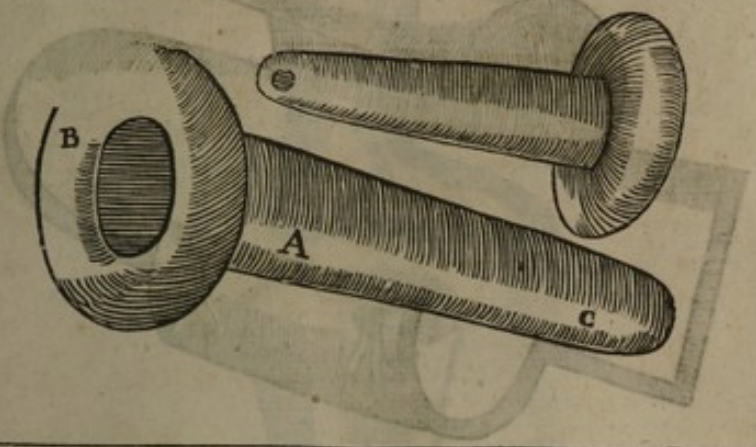


Thoſe that have their yards cut off cloſe to their bellies, are greatly troubled in makeing of urine, ſo that they are conſtrained to ſit down like women, for their eaſ. I have deviſed this pipe or conduit, haveing an hole through it as big as one finger, which may bee made of wood, or rather of latin.

A. and C. do ſhew the bigneſs and length of the pipe. B. ſheweth the brink on the broader end. D. ſheweth the out-ſide of the brink. This Inſtrument muſt bee applied to the lower

lower part of *os pectinis*: on the upper end it is compassed with a brink for the passage of the urine, for thereby it will receiv the urine better, and carrie it from the patient, as hee standeth upright.

The description of a pipe or conduit, serving in stead of the yard in makeing of water, which therefore wee may call an artificiall yard.

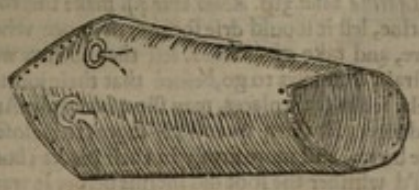


CHAP. X.

By what means the perished function or action of a thumb or finger may bee corrected and amended.

WHen a sinew or tendon is cut clean asunder, the action in that part, whereof it was the author, is altogether abolished; so that the member cannot bend or stretch out it self, unless it bee holpen by art: which thing I performed in a certain Gentleman belonging to *Annas* of *Montmorencie*, General of the French Horse-men, who in the battle of *Dreux* received so great a wound with a back-sword, upon the out-side of the wrist of the right hand, that the tendons that did erect or draw up the thumb were cut clean in sunder; and also, when the wound was throughly whole and consolidated, the thumb was bowed inwards, and fell into the palm of the hand, so that hee could not extend or lift it up, unless it were by the help of the other hand, and then it would presently fall down again; by reason whereof hee could hold neither sword, spear, nor javelin in his hand, so that hee was altogether unprofitable for war, without which hee supposed there was no life. Wherefore hee consulted with mee about the cutting away of his thumb, which did hinder his gripeing, which I refused to do, and told him, that I conceived a means how it might bee remedied without cutting away. Therefore I caused a case to bee made for it of latin, whereinto I put the thumb: this case was so artificially fastened by two strings that were put into two rings, made in it above the joint of the hand, that the thumb stood upright, and straight out, by reason whereof hee was able afterwards to handle anie kinde of weapon. An historie.

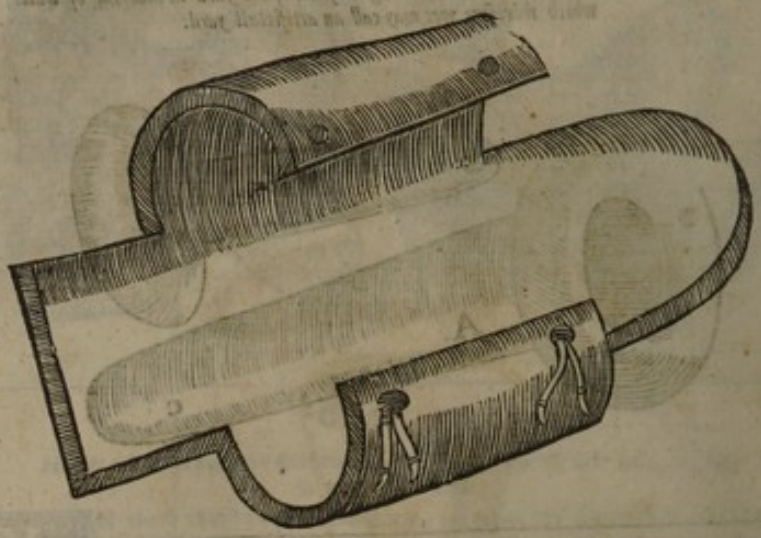
The form of a thumb or finger-stall of iron or latin, to lift up or erect the thumb, or anie other finger that cannot bee erected of it self.



If that in anie man the sinews or tendons, which hold the hand upright, bee cut asunder with a wound, so that hee is not able to lift up his hand, it may easily bee erected or lifted up with this Instrument that followeth, beeing made of an equal, straight, thin, but yet strong plate of latin, lined on the inner side with silk, or anie such like soft thing, and so plac't in the wrist of the hand, that it may com unto the palm, or the first joints of the

fingers; and it must bee tied above with convenient staies, and so the discommoditie of the depression, or hanging of the hand, may bee avoided: therefore this Instrument may bee called the Erector of the Hand.

The Erector of the Hand.



CHAP. XI.

Of helping those that are Vari *or* Valgi, *that is, crook-legged, or crook-footed, inwards or outwards.*

What *Varus* is.

THose are said to bee *Vari*, whose feet or legs are bowed or crooked inwards. This default is either from the first conformation in the womb, through the default in the mother, who hath her legs in like manner crooked; or becaus that in the time when shee is great with childe, shee commonly sit's with her legs acros: or els, after the childe is born, and that, either becaus his legs bee not well swathed, when hee is lai'd into the cradle, or els, becaus they bee not well pleased in carrying the infant; or if hee bee not well looked unto by the Nurs, when hee learneth to go: for the bones are verie tender, and almost as flexible as wax.

What *Valgus* is.

But contrariwise, those are called *Valgi*, whose legs are crooked or bowed outwards. This may com through the default of the first conformation, as well as the other; for by both, the feet also and the knees may bee made crooked; which thing, whosoever will amend, must restore the bones into their proper and natural place; so that in those that are *varous*, hee must thrust the bones outwards, as though hee would make them *valgous*: neither is it sufficient to thrust them so, but they ought also to bee retained there in their places after they are so thrust; for otherwise they being not well established, would slip back again.

They must bee stai'd in their places, by applying of collars and bolsters on that side whereunto the bones do lean, and incline themselvs; for the same purpose boots may bee made of leather, of the thickness of a testone, haveing a slit in the former part all along the bone of the leg, and also under the sole of the foot, that being drawn together on both sides, they may bee the better fitted, and sit closer to the leg. And let this medicine following bee applied all about the leg. R. *thuris, mastich. aloës, boli armeni, an.* ℥i. *aluminis roch. resinæ pini siccæ, subtilissimè pulveris. an.* ℥iii. *farinæ volat.* ℥iß. *album. ovor q.s.* make thereof a medicine. You may also add a little Turpentine, lest it should drie sooner, or more vehemently then is necessarie. But you must beware, and take great heed, lest that such as were of late *varous* or *valgous*, should attempt or strain themselvs to go, before that their joints bee confirmed; for so the bones that were lately set in their places, may slip aside again. And moreover, until they are able to go without danger, let them wear high shoos tied close to their feet, that the bones may bee staied the better, and more firmly in their places; but let that side of the soal of the shoo bee under-lai'd whither the foot did incline before it was restored.

A plaster to hold fast restored bones.

The

The form of little Boots, whereof the one is open, and the other shut.

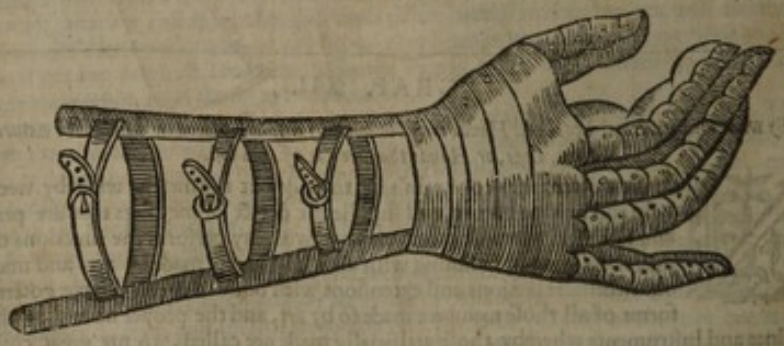
CHAP. XII.

By what means Arms, Legs, and Hands may bee made by art, and placed in stead of the natural Arms, Legs, or Hands that are cut off and lost.

NEcessitie oftentimes constrain's us to finde out the meanes whereby wee may help and imitate nature, and supplie the defect of members that are perished and lost. And hereof it commeth that wee may perform the functions of going, standing and handling with arms and hands made by art, and undergo our necessarie flexions and extensions with both of them. I have gotten the forms of all those members made so by art, and the proper names of all the Engines and Instruments whereby those artificially made are called, to my great cost and charges, of a most ingenuous and excellent Smith dwelling at *Paris*, who is called of those that know him, and also of strangers, by no other name then the little *Lorain*; and here I have caused them to bee portraied, or set down, that those that stand in need of such things, after the example of them, may cause som Smith, or such like work-man to serv them in the like case. They are not onely profitable for the necessitie of the bodie, but also for the decencie and comlines thereof. And here followeth their forms.

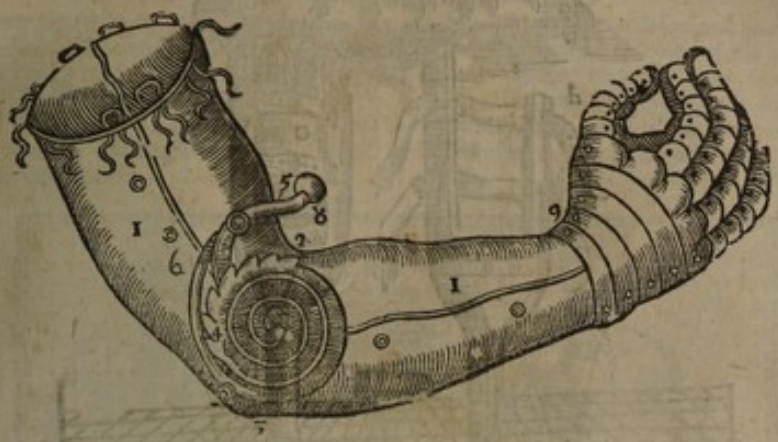
The form of an Hand made artificially of iron.

This figure following sheweth the back-side of an Hand artificially made, and so that it may bee tied to the arm or sleev.

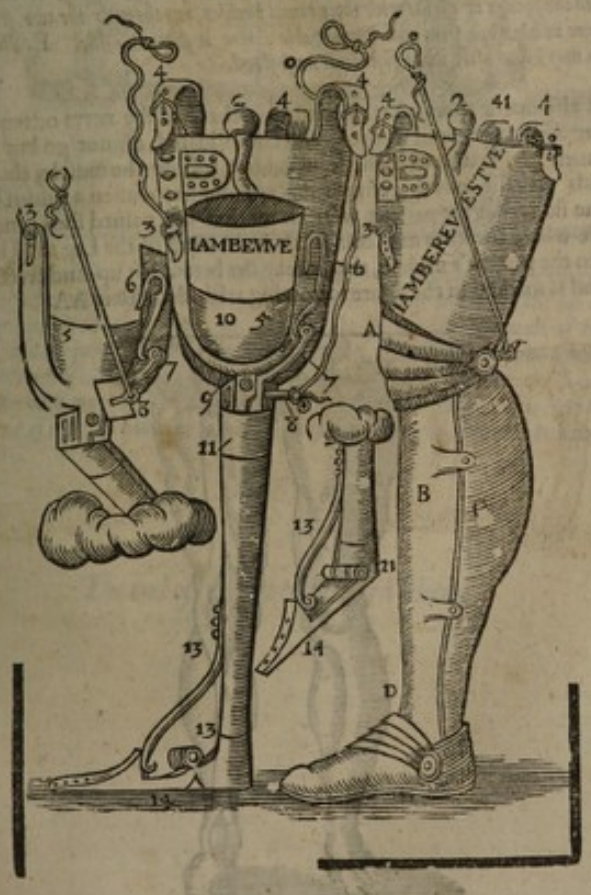


The

The form of an Arm made of iron verie artificially.

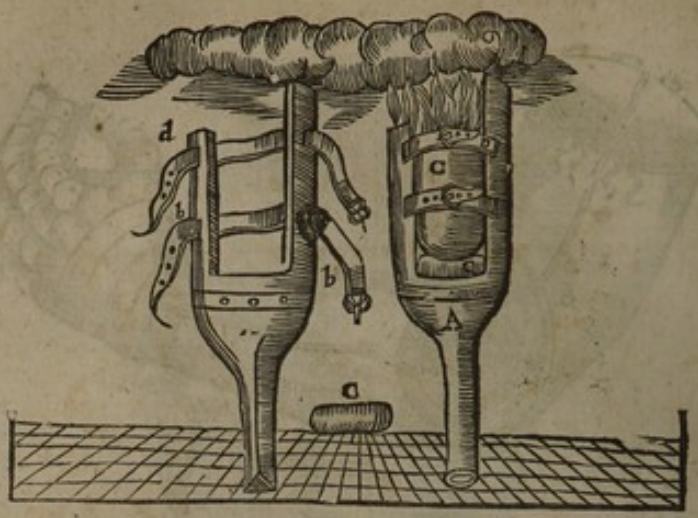


The description of Legs made artificially of iron.



The

The form of a woodden Leg made for poor men.



A. *Sheweth the ſtump or ſtock of the woodden Leg.* BB. *Sheweth the two ſtaies which muſt bee on both ſides of the Leg, the ſhorter of them muſt bee on the inner ſide.* CC. *Sheweth the pillow or bolſter, whereon the knee muſt reſt in the bottom between the two ſtaies, that ſo it may reſt the ſofter.* DD. *Sheweth the thongs or girths with their round buckles, put through the two ſtaies on either ſide to ſtay the knee in his place firm and immoovable, that it ſlip not aſide.* E. *Sheweth the thigh it ſelf, that you may know after what faſhion it muſt ſtand.*

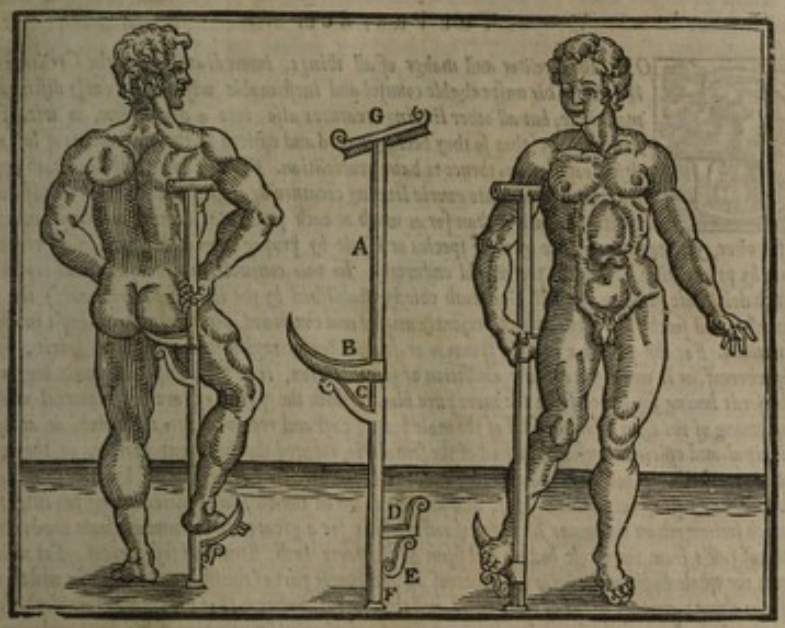
It happen's alſo manie times, that the patient, that had the nervs or tendons of his Leg wounded, long after the wound is whole and conſolidated, cannot go but with verie great pain and torment, by reaſon that the foot cannot follow the muſcle, that ſhould draw it up. That this maladie may bee remedied, you ought to faſten a linnen band made verie ſtrong unto the ſhoo that the patient weareth on that his pained foot; and at the knee it muſt have a ſlit where the knee may com forth in bowing of the Leg: and it muſt bee truſſed up faſt unto the patient's middle, that it may the better lift up and erect the foot in going. This band is marked in the figure following with the letters AA.

CHAP.

CHAP. XIII.

Of amending or helping lameneſs or halting.

HAlting is not onely a great deformitie, but alſo verie troubleſom and grievous. Therefore if that anie bee grieved therewith by reaſon that one of his legs is ſhorter then the other, it may bee holpen by putting under his ſhort foot this ſitting crutch, which, wee are now about to deſcribe. For by the help of this, hee ſhall not onely go upright, but alſo more eaſily and with little labor or no pain at all. It was taught mee by *Nicolas Piccard* Chirurgian to the Duke of Loraîn. The form thereof is this.



A. *Sheweth the ſtaff or ſtilt of this crutch, which muſt bee made of wood.* B. *Sheweth the Seat of iron whereon the thigh reſteth, juſt under the buttock.* C. *Sheweth a prop which ſtaieth up the ſeat whereon all the weight of the patient's bodie reſteth.* D. *Sheweth the ſtirrup, beeing made of iron, and bowing crooked upwards, that the foot may ſtand firm, and not ſlip off it when the patient goeth.* E. *Sheweth the prop that ſtaieth or holdeth up the ſtirrup to ſtrengthen it.* F. *Sheweth the foot of the ſtilt or crutch made of iron with manie pikes, and compaſſed with a ring or ferule, ſo to keep it from ſlipping.* G. *The croſs or head of the crutch which the patient muſt put under his arm-hole to lean upon, as it is to bee ſeen in the figure.*

The end of the twentie third Book.

Of the GENERATION of Man.

The twentie fourth Book.

THE PREFACE.

The distinction of male and female.

The cause of this distinction.

GOD, the Creator and maker of all things, immediately after the Creation of the World, of his unspeakable counsel and inestimable wisdom not onely distinguished mankinde, but all other liveing creatures also into a double sex, to wit, of male and female; that so they beeing moved and enticed by the allurements of lust, might desire copulation, thence to have procreation. For this bountiful Lord hath appointed it as a solace unto everie liveing creature against the most certain and fatal necessitie of death: than for as much as each particular liveing creature cannot continue for ever, yet they may endure by their species or kinde by propagation and succession of creatures, which is by procreation, so long as the world endureth. In this conjunction or copulation replenished with such delectable pleasure, (which God hath chiefly established by the law of Matrimonie,) the male and female yeeld forth their seeds, which presently mixed and conjoined, are received and kep't in the female's womb. For the seed is a certain spumous or foamie humor replenished with vital spirit, by the benefit whereof, as it were by a certain ebullition or fermentation, it is puffed up, and swoln bigger, and both the seeds beeing separated from the more pure blood of both the parents, are the material and formal beginning of the issue; for the seed of the male beeing cast and received into the womb, is accounted the principal and efficient cause; but the seed of the female is reputed the subjacent matter, or the matter whereon it worketh. Good and laudable seed ought to bee white, shining, clammie, knottie, smelling like unto the elder or palm, delectable to bees, and sinking down in the bottom of water beeing put into it, for that which swimmeth on the water is esteemed unfruitful; for a great portion commeth from the brain, yet som thereof fall's from the whole bodie, and from all the parts both firm and soft thereof. For unless it com from the whole bodie, and everie part thereof, all and everie part of the issue cannot bee formed thereby: becaus like things are engendred of their like: and therefore it commeth that the childe resembleth the parents, not onely in stature and favor, but also in the conformation and proportion of his limbs and members, and complexion and temperature of his inward parts, so that diseases are oft-times hereditarie, the weakness of this or that entral beeing translated from the parent to the childe. There are som which suppose this falling of the seed from the whole bodie not to to bee understood according to the weight and matter, as if it were a certain portion of all the blood separated from the rest; but according to the power and form, that is to say, the animal, natural and vital spirits, beeing the framers of formation and life, and also the formative facultie to fall down from all the parts into the seed, that is wrought or perfected by the Testicles; for proof and confirmation whereof, they alledg that manie perfect, sound, absolute, and well proportioned children, are born of lame and decrepit parents.

What seed is.

The conditions of good seed.

Seed falleth from all the parts of the bodie.

Wherefore manie diseases are hereditarie.

How seed is to bee understood to fall from the whole bodie.

CHAP. I.

Why the generative parts are endued with great pleasure.

What moveth a man to copulation.

ACertain great pleasure accompanieth the function of the parts appointed for generation, and before it, in liveing creatures that are of a lustie age, when matter aboundeth in those parts, there goeth a certain fervent or furious desire: the causes thereof manie, of which the chiefest is, That the kinde may bee preserved and kept for ever, by the propagation and substitution of other liveing creatures of the same kinde. For brute beasts which want reason, and therefore cannot bee solicitous for the preservation of their kinde, never com to carnal copulation, unless they bee mooved thereunto by a certain vehement provocation of unbridled lust, and as it were by the stimulation of venerie. But man, that is endued with reason, beeing a divine and most noble creature, would never yeeld nor make his minde subject to a thing so abject and filthie as is carnal copulation, but that the venereous ticklings, raised in those parts, relax the severitie of his minde; or reason admonisheth him that the memorie of his name ought not to end with his life, but to be preserved unto all generations, as far as may bee possible, by the propagation of his seed or issue. Therefore by reason of this profit or commoditie, nature hath

hath endued the genital parts with a far more exact or exquisite sens then the other parts, by sending the great sinews unto them, and moreover shee hath caussed them to bee bedewed or moistned with a certain whayish humor, not much unlike the seed sent from the glandules or kernels called *prostatæ*, situated in men at the beginning of the neck of the bladder, but in women at the bottom of the womb: this moisture hath a certain sharpnes or biteing, for that kinde of humors of all others can chiefly provoke those parts to their function or office, and yeeld them a delectable pleasure, while they are in execution of the same. For even so whayish and sharp humors, when they are gathered together under the skin, if they wax warm, tickle with a certain pleasant itching, and by their motion infer delight: but the nature of the genital parts or members is not stirred up or provoked to the expulsion of the seed with these provocations of the humors, abounding either in quantitie or qualitie onely, but a certain great and hot spirit or breath contained in those parts, doth begin to dilate it self more and more, which causseth a certain incredible exces of pleasure or voluptuousnes, wherewith the genitals beeing replete, are spread forth or dilated everie waie unto their ful greatnes. The yard is given to men whereby they may cast out their seed directly or straightly into the woman's womb, and the neck of the womb to women, whereby they may receiv that seed so cast forth, by the open or wide mouth of the same neck, and also that they may cast forth their own seed, sent through the spermatick vessels unto their testicles; these spermatick vessels, that is to say, the vein lying above, and the arterie lying below, do make manie flexions or windeings, yet one as manie as the other, like unto the tendrils of vines diversly platted or folded together, and in these folds or bendings the blood and spirit which are carried unto the testicles, are concocted a longer time, and so converted into a white seminal substance. The lower of these flexions or bowings do end in the stones or testicles. But the testicles, forasmuch as they are loos, thin, and spongeous or hollow, receiving the humor which was begun to bee concocted in the fore-named vessels, concoct it again themselvs: but the testicles of men concoct the more perfectly for the procreation of the issue; and the testicles of women more imperfectly, becaus they are more cold, les, weak and feeble, but the seed becommeth white by the contact or touch of the testicles, becaus the substance of them is white. The male is such as engendreth in another, and the female in her self, by the spermatick vessels which are implanted in the inner capacitie of the womb. But out of all doubt unles nature had prepared so manie allurements, baits and provocations of pleasure, there is scarce anie man so hot or delighted in venereous acts, which considering and marking the place appointed for humane conception, the loathsomnes of the filth which daily falleth down unto it, and wherewithall it is humected and moistned, and the vicinitie and nearnes of the great gut under it, and of the bladdder above it, but would shun the embraces of women. Nor would anie woman desire the companie of man, which once premeditate's or fore-think's with her self on the labor that shee shall sustain in bearing the burthen of her childe nine months, and of the almost deadlie pains that shee shall suffer in her deliverie.

Why the genitals are endued with a whayish moisture.

The caus of the foldings of the spermatick vessels.

Women's testicles more imperfect.

Why manie men and women abhor venereous copulation.

Men that use too frequent copulation, oftentimes in stead of seed cast forth a crude and bloodie humor, and somtimes also meer blood it self; and oft-times they can hardly make water but with great pain, by reason that the clammie and oilie moisture, which nature hath placed in the glandules called *prostatæ*, to make the passage of the urine slipperie, and to defend it against the sharpnes of the urine that passeth through it, is wasted, so that afterward they shall stand in need of the help of a Surgeon to caus them to make water with eas and without pain, by injecting of a little oil out of a Syringe into the conduit of the yard. For in generation it is fit the man cast forth his seed into the womb, with a certain impetuositie, his yard beeing stiff and distended, and the woman to receiv the same without delay into her womb, beeing wide open, lest that through delay the seed wax cold, and so becom unfruitful by reason that the spirits are dissipated and consumed. The yard is distended or made stiff, when the nervous, spongeous and hollow substance thereof is replete and puffed up with a flatulent spirit. The womb allure's or draw's the masculine seed into it self by the mouth thereof, and it receiv's the woman's seed by the horns from the spermatick vessels which com from the testicles into the hollownes or concavitie of the womb, that so it may bee tempered by conjunction, commistion and confusion with the man's seed, and so reduced or brought unto a certain equalitie: for generation or conception cannot follow without the concours of two seeds, well and perfectly wrought in the verie same moment of time, nor without a laudable disposition of the womb both in temperature and complexion: if in this mixture of seeds the man's seed in qualitie and quantitie exceed the woman's, it will bee a man-childe; if not, a woman-childe, although that in either of the kindes there is both the man's and woman's seed; as you may see by the dailie experience of those men who by their first wives have had boies onely, and by their second wives had girls onely: the like you may see in certain women, who by their first husbands have had males onely, and by their second husbands females onely. Moreover one and the same man is not alwaies like affected to get a man or a woman-childe; for by reason of his age, temperature and diet, hee doth somtimes yeeld forth seed endued with a masculine virtue, and somtimes with a feminine or weak

Why the strangurie ensueth immoderate copulation.

What things necessarie unto generation.

Why a male, and why a female is engendred.

weak virtue, ſo that it is no marvel if men get ſomtimes men, and ſomtimes women-children.

CHAP. II.

Of what qualitie the ſeed is, whereof the male, and whereof the female is engendred.

Why men children are ſooner formed in the womb then women.

The ſeed is that in power from whence each thing cometh or floweth.

Why the children are moſt commonly like unto their fathers.

When children ſhould bee begotten.

Why oftentimes the childe reſembleth the Grandfather.

Why ſomtimes thoſe that are diſeaſed do get ſound children.

MAle children are engendred of a more hot and drie ſeed, and women of a more cold and moiſt: for there is much leſs ſtrength in cold then in heat, and likewiſe in moiſture then in drineſs; and that is the cauſ why it will bee longer before a girl is formed in the womb then a boy. In the ſeed lieth both the procreative and the formative power: as for example; In the power of Melon-ſeed are ſituate the ſtalks, branches, leavs, flowrs, fruit, the form, color, ſmel, taſte, ſeed and all. The like reaſon is of other ſeeds; ſo Apple-grafts engrafted in the ſtock of a Pear-tree, bear Apples; and wee do alwaies finde and ſee by experience, that the tree (by virtue of grafting) that is grafted, doth convert it ſelf into the nature of the Siens wherewith it is grafted. But although the childe that is born doth reſemble or is verie like unto the father or the mother, as his or her ſeed exceedeth in the mixture; yet for the moſt part it happeneth that the children are more like unto the father then the mother, becauſ that in the time of copulation, the minde of the woman is more fixed on her husband, then the minde of the husband on, or towards his wife: for in time of copulation or conception, the forms, or the likneſſes of thoſe things that are conceived or kept in minde, are tranſported and impreſſed in the childe or iſſue; for ſo they affirm that there was a certain Queen of the Æthiopians who brought forth a white childe, the reaſon was (as ſhee confeſſed) that at the time of copulation with her King, ſhee thought on a marvelous white thing, with a verie ſtrong imagination. Therefore *Heſiod* advertiſeth all married people not to give themſelvs to carnal copulation when they return from burials, but when they com from feaſts and plaies, leſt that their ſad, heavie, and penſive cogitations, ſhould bee ſo tranſfuſed and engrafted in the iſſue, that they ſhould contaminate or infect the pleaſant joifulneſs of his life with ſad, penſive or paſſionate thoughts. Somtimes it happeneth, although verie ſeldom, the childe is neither like the father nor the mother, but in favor reſembleth his Grandfather, or anie other of his kindred, by reaſon that in the inward parts of the parents, the engrafted power and nature of the Grandfather lieth hidden: which when it hath lurked there long, not working anie effect, at length break's forth by means of ſom hidden occaſion: wherein nature reſembleth the Painter, makeing the lively portraiture of a thing, which as far as the ſubject matter will permit, doth form the iſſue lik unto the parents in everie habit; ſo that often-times the diſeaſes of the parents are transferred or participated unto the children, as it were by a certain hereditarie title: for thoſe that are crook-back't get crook-back't children, thoſe that are lame, lame; thoſe that are leprous, leprous; thoſe that have the ſtone, children haveing the ſtone; thoſe that have the ptiſick, children haveing the ptiſick; and thoſe that have the gout, children haveing the gout: for the ſeed follow's the power, nature, temperature and complexion of him that engendereth it. Therefore of thoſe that are in health and ſound, healthie and ſound; and of thoſe that are weak and diſeaſed, weak and diſeaſed children are begotten, unleſs happily the ſeed of one of the parents that is ſound doth correct or amend the diſeaſed impreſſion of the other that is diſeaſed, or elſ the temperate and ſound womb as it were by the gentle and pleaſant breath thereof.

CHAP. III.

What is the cauſ why Females of all brute beaſts, beeing great with young, do neither deſire, nor admit the males, until they have brought forth their Young.

Why the ſenſ of venereous acts is given to brute beaſts.

Why of brute beaſts the males rageing with luſt, follow after the females.

Wherefore a woman when ſhee is with childe, deſireth copulation.

THe cauſ hereof is, foraſmuch as they are mooved by ſenſ onely, they applie themſelvs unto the thing that is preſent, verie little, or nothing at all perceiving things that are paſt, and to com. Therefore after they have conceived, they are unmindeful of the pleaſure that is paſt, and do abhor copulation: for the ſenſ or feeling of luſt is given unto them by nature, onely for the preſervation of their kinde, and not for voluptuouſneſs, or delectation. But the males rageing, ſwelling, and as it were ſtimulated by the provocations of the heat, or fervencie of their luſt, do then run unto them, follow and deſire copulation, becauſ a certain ſtrong odor or ſmell commeth into the air from their ſecret or genital parts, which pierceth into their noſtrils, and unto their brain, and ſo inferreth an imagination, deſire, and heat. Contrariwiſe, the ſenſ and feeling of venereous actions ſeemeth to bee given by nature to women, not onely for the propagation of iſſue and for the conſervation of mankinde, but alſo to mitigate and aſſwage the miſeries of man's life, as it were by the entiſements of that pleaſure: alſo the great ſtore of hot blood that is about the heart, wherewith men abound, maketh greatly to this

this purpose, which by impulsion of imagination, which ruleth the humors, beeing driven by the proper passages down from the heart and entrals into the genital parts, doth stir up in them a new lust.

The males of brute beasts, beeing provoked or mooved by the stimulations of lust, rage, and are almost burst with a *Tentigo* or extension of the genital parts, and sometimes wax mad; but after that they have satisfied their lust with the female of their kinde, they presently becom gentle, and leav off such fierceness.

CHAP. IV.

What things are to bee observed, as necessarie unto generation in the time of copulation.

How women may bee mooved to venerie & conception.

WHen the husband commeth into his wive's chamber, hee must entertain her with all kinde of dalliance, wanton behavior, and allurements to venerie; but if hee perceiv her to bee slow, and more cold, hee must cherish, embrace, and tickle her, and shall not abruptly, the nervs beeing suddenly distended, break into the field of nature; but rather shall creep in by little and little, intermixing more wanton kisses with wanton words and speeches, handling her secret parts and dugs, that shee may take fire, and bee enflamed to venerie; for so at length the womb will strive and wax fervent with a desire of casting forth its own seed, and receiving the man's seed to bee mixed together therewith. But if all these things will not suffice to enflame the woman; for women for the most part are more slow and slack unto the expulsion or yeelding forth of their seed, it shall bee necessarie first to foment her secret parts with the decoction of hot herbs made with Muscadine, or boiled in anie other good wine; and to put a little Musk or Civet into the neck or mouth of the womb: and when shee shall perceiv the efflux of her seed to approach, by reason of the tickling pleasure, shee must advertise her husband thereof, that at the verie instant time or moment, hee may also yeeld forth his seed, that by the concourse or meeting of the seeds, conception may bee made; and so at length a childe formed and born. And that it may have the better success, the husband must not presently separate himself from his wive's embraces, lest the air strike into the open womb, and so corrupt the seeds before they are perfectly mixed together. When the man depart's, let the woman lie still in quiet, laying her legs or her thighs across, one upon another; and raising them up a little, lest that by motion or downward situation, the seed should bee shed or spilt: which is the cause why shee ought at that time not to talk, especially chideing, nor to cough, nor sneese, but give her self to rest and quietness, if it bee possible.

The meeting of the seeds most necessarie for generation.

CHAP. V.

By what signs it may bee known, whether the woman have conceived, or not.

IF the seed in the time of copulation, or presently after bee not spilt, if in the meeting of the seeds the whole bodie do somwhat shake, that is to say, the womb drawing it self together for the compression and enterteinment thereof, if a little feeling of pain doth run up and down the lower bellie, and about the navel, if shee bee sleepie, if shee loath the embraceings of a man, and if her face bee pale, it is a token that shee hath conceived.

Spots or specks in the faces of those that are with childe.

In som, after conception spots or freckles arise in their face, their eies are depressed and sunk in, the white of their eies waxeth pale, they wax giddie in the head, by reason that the vapors are raised up from the menstrual blood that is stopped, sadness and heaviness griev their mindes, with loathing and waiwardness, by reason that the spirits are covered with the smoakie darkness of the vapors: pains in the teeth and gums, and swounding often-times commeth; the appetite is depraved or overthrown, with aptness to vomit, and longing, whereby it happeneth, that they loath meats of good juice, and long for and desire illaudable meats, and those that are contrarie to nature, as coles, dirt, ashes, stinking salt-fish, sowr, austere and tart fruits, pepper, vinegar, and such like acrid things, and other, altogether contrarie to nature and use, by reason of the condition of the suppressed humor abounding and falling into the orifice of the stomach. This appetite so depraved or overthrown, endureth in som until the time of childe-birth; in others it commeth in the third moneth after their conception, when hairs do grow on the childe: and lastly, it leaveth them a little before the fourth moneth; becaus that the childe, beeing now greater and stronger, consume's a great part of the excremental and superfluous humor. The suppressed or stopped terms in women that are great with childe, are divided into three parts: the more pure portion maketh the nutrinient for the childe, the second ascendeth by little and little into the dugs, and the impurest of all remaineth in the womb about the infant, and maketh the secondine or after-birth, wherein the infant lieth as in a soft bed. Those women are great

Why manie women beeing great with childe refuse laudable meats, and desire those that are illaudable, and contrarie to nature.

The suppressed terms divided into three parts.

with childe, whose urine is more sharp, fervent, and somwhat bloodie, the bladder not onely waxing warm by the compression of the womb; fervent, by reason of the blood contained in it, but also the thinner portion of the same blood beeing expressed, and sweating out into the bladder. A swelling and hardness of the dugs, and veins that are under the dugs in the brests and about them, and milk comming out when they are pressed, with a certain stirring motion in the bellie, are certain infallible signs of greatness with childe. Neither in this greatness of childe-bearing, the veins of the dugs onely, but of all the whole bodie, appear full and swelled up, especially the veins of the thighs and legs; so that by their manifold folding and knitting together, they do appear varicous, whereof commeth sluggishness of the whole bodie, heavines and impotencie, or difficultie of going, especially when the time of deliverance is at hand. Lastly, if you would know whether the woman have conceived or not, give unto her when shee goeth to sleep, som meed or honied water to drink; and if shee have a gripeing in her guts or bellie, shee hath conceived; if not, shee hath not conceived.

Hip. 1. de morb. mul.

Aph. 41. sect. 5.

CHAP. VI.

That the womb, so soon as it hath received the seed, is presently contracted, or drawn together.

AFter that the seeds of the male and female have both met, and are mixed together in the capacitie of the womb, then the orifice thereof doth draw it self close together, lest the seeds should fall out. There the female's seed goeth and turneth into nutriment, and the increas of the male's seed; becaus all things are nourished, and do increas by those things that are most familiar, and like unto them. But the similitude and familiaritie of seed with seed is far greater then with blood; so that when they are perfectly mixed and co-agulated together, and so wax warm by the straight and narrow incloſure of the womb, a certain thin skin doth grow about it, like unto that that will bee over unscimmed milk.

Why the female seed is nutriment for the male seed.

Moreover, this concretion or congealing of the seed, is like unto an egg laied before the time that it should: that is to say, whose membrane or tunicle that compasseth it about, hath not as yet increased or grown into a shellie hardness about it; in folding-wise are seen manie small threds divideing themselvs, over-spread with a certain clammie, whitish or red substance, as it were with black blood. In the middest under it appeareth the navel, from whence that small skin is produced. But a man may understand manie things that appertain unto the conception of mankinde by the observation of twentie egs, setting them to bee hatched under an Hen, and takeing one everie daie and breaking it, and diligently considering it; for in so doing, on the twentieth daie you shall finde the Chick perfectly formed with the navel. That little skin that so compasseth the infant in the womb is called the secundine or *Chorion*, but commonly the after-birth.

A compendious way to understand humane conception.

This little skin is perfectly made within six daies, according to the judgment of *Hippocrates*, as profitable and necessarie not onely to contain the seeds so mixed together, but also to suck nutriment through the orifices of the vessels ending in the womb. Those orifices the Greeks do call *Cotyledones*, and the Latines *Acetabula*, for they are as it were hollowed eminences, like unto those, which may bee seen in the feet or snout of a Cuttle-fish manie times in a double order, both for the working and holding of their meat. Those eminences called *Acetabula* do not so greatly appear in women as in manie brute beasts. Therefore by these the secundine cleaveth on everie side unto the womb, for the conservation, nutrition, and increas of the conceived seed.

Lib. de nat. puer.

What the *Cotyledones* are.

CHAP. VII.

Of the generation of the navel.

AFter the woman hath conceived, to everie one of the aforesaid eminencies groweth presently another vessel, that is say, a vein to the vein, and an arterie to the arterie: these soft, and yet thin vessels, are framed with a little thin membrane, which beeing spread under, sticketh to them; for to them it is in stead of a membrane, and a ligament, and a tunicle, or a defence; and it is doubled with the others, and made of the vein and arterie of the navel. These new small vessels of the infant, with their orifices, do answer directly one to one to the *Cotyledons* or eminencies of the womb; they are verie small and little, as it were the hairie *fibres* that grow upon roots that are in the earth; and when they have continued so a longer time, they are combined together, that of two they are made one vessel, until that by continual connexion, all those vessels go and degenerate into two other great vessels, called the *umbilical* vessels, or the vessels of the navel; becaus they do make the navel, and do enter

enter into the childe's bodie by the hole of the navel. Here *Galen* doth admire the singular providence of God and Nature; becauſ that in ſuch a multitude of veſſels, and in ſo long a paſſage or length that they go or are produced, the vein doth never confound it ſelf, nor ſtick to the arterie, nor the arterie to the vein; but everie veſſel joineth it ſelf to the veſſel of its own kinde. But the umbilical vein, or navel-vein, entering into the bodie of the childe, doth join it ſelf preſently to the hollow part of the liver; but the arterie is divided into two, which join themſelvs to the two Iliack arteries along the ſides of the bladder, and are preſently covered with the *peritonæum*; and by the benefit thereof are annexed unto the parts which it goe's unto. Thoſe ſmall veins and arteries are as it were the roots of the childe; but the vein and arterie of the navel are as it were the bodie of the tree, to bring down the nutriment to nouriſh the childe. For firſt, wee live in the womb the life of a plant, and then next the life of a ſenſitive creature: and, as the firſt tunicle of the childe is called *Chorion*, or *Allantoides*; ſo the other is called *Amnios*, or *Agnina*, which doth compaſs the ſeed or childe about on everie ſide. Theſe membranes are moſt thin, yea for their thinneſs like unto the Spider's web, woven one upon another; and alſo connexed in manie places by the extremities of certain ſmall and hairie ſubſtances, which at length, by the adjunction of their like do get ſtrength; whereby you may underſtand, what is the cauſ why by divers and violent motions of the mother in going and dancing, or leaping, and alſo of the infant in the womb, thoſe membranes are not almoſt broken. For they are ſo conjoined by the knots of thoſe hairie ſubſtances, that between them nothing, neither the urine, nor the ſweat can com, as you may plainly and evidently perceiv in the diſſection of a woman's bodie that is great with childe, not depending on anie other man's opinion, bee it never ſo old or inveterate: yet the ſtrength of thoſe membranes is not ſo great, but that they may bee ſoon broken in the birth, by the kicking of the childe.

The vein never joineth it ſelf with the arterie.

Hippocrates calleth all the membranes that compaſs the infant in the womb, according to the judgment of *Galen* in his book *de uſu partium*, by the name of the *ſtecandines*.

CHAP. VIII.

Of the Umbilical veſſels, or the veſſels belonging to the navel.

MAnie of the antient Writers have written that there are five veſſels found in the navel. But yet in manie, nay all the bodies I ſought in for them, I could never finde but three; that is to ſay, one vein, which is very large, ſo that in the paſſage thereof it will receiv the tag of a point, and two arteries, but not ſo large, but much narrower; becauſ the childe wanteth or ſtandeth in need of much more blood for his conformation, and the nutriment or increaſ of his parts, then of vital ſpirit.

An old opinion confuted.

Theſe veſſels makeing the bodie of the navel, which, as it is thought, is formed within nine or ten daies, by their doubling and folding, make knots like unto the knots of a Franciſcan Friers girdle, that ſtaying the running blood in thoſe their knottie windeings, they might more perfectly concoct the ſame: as may bee ſeen in the ejaculatorie ſpermatick veſſels, for which uſe alſo the length of the navel is half an ell; ſo that in manie infants that are ſomwhat grown, it is found three or four times doubled about their neck or thigh.

To what uſe the knots of the childe's navel in the womb ſerveth.

As long as the childe is in his mother's womb, hee taketh his nutriment onely by the navel, and not by his mouth; neither doth hee enjoy the uſe of eies, ears, noſtrils or fundament, neither needeth hee the functions of the heart. For ſpirituous blood goeth unto it by the arteries of the navel, and into the Iliack arteries; and from the Iliack arteries unto all the other arteries of the whole bodie, for by the motion of theſe onely the infant doth breathe. Therefore it is not to bee ſuppoſed that the air is carried or drawn in by the lungs unto the heart, in the bodie of the childe; but contrariwiſe from the heart to the lungs. For neither the heart doth perform the generation or working of blood, or of the vital ſpirits. For the iſſue or infant is contented with them as they are made and wrought by his mother. Which, until it hath obtained a full, perfect and whole deſcription of his parts and members, cannot bee called a childe; but rather an embryon, or an imperfect ſubſtance.

The childe in the womb taketh his nutriment by his navel, not by his mouth.

How the childe breatheth.

CHAP. IX.

Of the ebullition or ſwelling of the ſeed in the womb, and of the concretion of the bubbles or bladders, or the three principal entrals.

IN the ſix firſt daies of conception the new veſſels are thought to bee made and brought forth of the eminencies or *cotylidons* of the mother's veſſels, and diſperſed into all the whole ſeed, as they were *fibres*, or hairie ſtrings. Thoſe, as they pierce the womb, ſo do they equally and in like manner penetrate the tunicle *Chorion*. And it is carried this way, beeing a paſſage not onely neceſſarie for the nutriment and conformation of the parts, but alſo into the veins diverſly woven and diſperſed into the skin *Chorion*. For thereby it commeth

to pass, that the seed it self boileth, and as it were fermenteth or swelleth, not onely through occasion of the place, but also of the blood and vital spirits that flow unto it; and then it riseth into three bubbles or bladders, like unto the bubbles which are occasioned by the rain falling into a river or channel full of water. These three bubbles or bladders, are certain rude, or new forms, or concretions of the three principall entrals, that is to say, of the liver, heart and brain. All this former time it is called seed, and by no other name; but when those bubbles arise, it is called an embryon, or the rude form of a bodie until the perfect conformation of all the members: on the fourth day after that the vein of the navel is formed, it sucketh grosser blood, that is, of a more full nutriment out of the *Cotylidons*. And this blood, becaus it is more gross, easily congeal's and curdle's in that place, where it ought to prepare the liver fully and absolutely made. For then it is of a notable great bigness above all the other parts; and therefore it is called *Parenchyma*, becaus it is but onely a certain congealing or concretion of blood brought together thither, or in that place. From the gibbous part thereof springeth the greater part or trunk of the hollow vein, called commonly *vena cava*, which doth disperse his small branches, which are like unto hairs, into also the substance thereof: and then it is divided into two branches, whereof the one goeth upwards, the other downwards unto all the particular parts of the bodie.

The three bladders.

When the seed is called an an embryon.

Why the liver is called Parenchyma.

In the mean season the arteries of the navel suck spirituous blood out of the eminencies or *Cotylidons* of the mother's arteries, whereof, that is to say, of the more fervent and spirituous blood, the heart is formed in the second bladder or bubble, being endued with a more fleshie, sound, and thick substance, as it behooveth that vessel to bee, which is the fountain from whence the heat floweth, and hath a continual motion.

In this the virtue formative hath made two hollow places; one on the right side, another on the left. In the right, the root of the hollow vein is infixed or ingrafted, carrying thither necessarie nutriment for the heart: in the left is formed the stamp or root of an arterie, which presently doth divide it self into two branches; the greater whereof goeth upwards to the upper parts, and the wider unto the lower parts, carrying unto all the parts of the bodie life and vital heat.

CHAP. X.

Of the third Bubble or Bladder, wherein the head and the brain is formed.

THe far greater portion of the seed goeth into this third bubble, that is to say, yeelding matter for the conformation of the brain, and all the head. For a greater quantitie of seed ought to go unto the conformation of the head and brain; becaus these parts are not sanguine or bloodie, as the heart and liver; but in a manner without blood, bonie, marrow, cartilaginous, nervous, and membranous, whose parts, as the veins, arteries, nerves, ligaments, panicles, and skin, are called *spermatick* parts; becaus they obtain their first conformation almost of seed onely: although that afterwards they are nourished with blood, as the other fleshie and musculous parts are. But yet the blood, when it is com unto those parts, degenerateth, and turneth into a thing somwhat spermatick, by virtue of the assimulative facultie of those parts. All the other parts of the head, form and fashion themselvs unto the form of the brain, when it is formed; and those parts which are situated and placed about it for defence especially, are hardened into bones.

Why the greater portion of seed goeth into generation of the head and brain.

The head, as the seat of the senses, and mansion of the minde and reason, is situated in the highest place; that from thence, as it were from a loftie tower or turret, it might rule and govern all the other members, and their functions and actions that are under it: for there the soul or life, which is the rectress or governess, is situated; and from thence it floweth, and is dispersed into all the whole bodie. Nature hath framed these three principal entrals, as props and sustentations for the weight of all the rest of the bodie: for which matter also shee hath framed the bones.

Why the head is placed on the top of the bodie.

The first bones that appear to bee formed, or are supposed to bee conformed, are the bones called *ossa Ilium*, connexed or united by spondyls that are between them: then all the other members are framed and proportioned by their concavities and hollownesses, which generally are seven, that is to say, two of the ears, two of the nose, one of the mouth, and in the parts beneath the head, one of the fundament, and another of the *yard* or conduit of the bladder; and furthermore in women, one of the neck of the womb, without the which they can never bee made mothers or bear children.

When all these are finished, nature, that shee might polish her excellent work in all sorts, hath covered all the bodie and everie member thereof with skin. Into this excellent work or *Microcosmos* so perfected, God, the author of nature and all things, infuseth or ingrafteth a soul or life: which St. *Augustine* prooveth by this sentence of *Moses*: *If anie man smite a woman with child, so that thereby shee bee delivered before her natural time, and the child be dead, being first formed in the womb, let him die the death: but if the child hath not as yet obtained the ful proportion*

Exod. 20. 21. 22

and

and conformation of his bodie and members, let him recompence it with monie. Therefore it is not to bee thought that the life is derived, propagated or taken from *Adam* or our parents, as it were an hereditarie thing distributed unto all mankinde by their parents; but wee must believ it to bee immediately created of God, even at the verie instant time when the child is absolutely perfected in the lineaments of his bodie, and so given unto it by him.

So therefore the rude lumps of flesh called *molæ* that engender in women's wombs, and monsters of the like breeding and confused bignes, although by reason of a certain quakeing and shivering motion, they seem to have life, yet they cannot bee supposed to bee endued with a life or a reasonable soul: but they have their motion, nutriment and increas wholly of the natural and infixed facultie of the womb, and of the generative or procreative spirit that is ingraffed naturally in the seed. The *mola* in the womb liveth not as the childe.

But even as the infant in the womb obtaineth not perfect conformation before the thirtieth day, so likewise it doth not move before the sixtieth day: at which time it is most commonly not perceived by women, by reason of the smalnes of the motion. But now let us speak briefly of the life or soul, wherein consisteth the principal original of everie function in the bodie, and likewise of generation.

CHAP. XI.

Of the life or soul.

THE soul entreth into the bodie, so soon as it hath obtained a perfect and absolute distinction and conformation of the members in the womb, which in male-children, by reason of the more strong and forming heat which is ingraffed in them, is about the fortieth day, and in females about the fortie fifth day; in som sooner, and in som later, by reason of the efficacie of the matter working, and pliantnes or obedience of the matter whereon it worketh. Neither doth the life or soul beeing thus inspired into the bodie presently execute or perform all his functions, becaus the instruments that are placed about it cannot obtain a firm and hard consistence necessarie for the lively, but especially for the more divine ministeries of the life or soul, but in a long proces of age or time. The life goeth not into the mas of seed that doth engender the childe, before the bodie of the childe and each part thereof hath his perfect proportion and form.

Those instruments of the soul are vitiated either in the first conformation, as when the form or fashion of the head is shaped upwards or pyramidal, as was the head of *Thersites*, that lived in the time of the Trojan war, and of *Tribonlet* and *Tonin*, that lived in later years; or also by som casualtie, as by the violent handling of the midwife, who by compression, by reason that the soul is then tender and soft, hath caused the capacitie of the ventricles that bee under the brain to bee too narrow for them: or by a fall, stroak, disorder in diet, as by drunkennes, or a fever, which inferreth a lithargie, excessive sleepines, or phrensie. Why the life or soul doth not presently execute all his offices.

Presently after the soul is entred the bodie, God endueth it with divers and sundrie gifts: hereof it commeth that som are endued with wisdom by the spirit; others with knowledg by the same spirit; others with the gift of healing by the same spirit; others with power, dominion and rule; others with prophesie; others with diversities of tongues; and to others other endowments, as it hath pleased the divine providence and bountie of God to bestow upon them, against which no man ought to contend or speak. *For it is not meet that the thing formed should say unto him that formed it, why hast thou made mee thus? hath not the Potter power to make of the same lump of claie one vessel to honor and another to dishonor?* it is not my purpose, neither belongeth it unto mee or anie other humane creature to search out the reason of those things, but onely to admire them with all humilitie, But yet I dare affirm this one thing, that a noble and excellent soul neglecteth elementarie and transitorie things, and is ravished and mooved with the contemplation of celestial, which it cannot freely enjoie before it bee separated from this earthlie inclosure or prison of the bodie, and bee restored unto its original. *1 Cor. c. 12.*

Therefore the soul is the inward *Entelechia* or perfection, or the primitive cauf of all motions and functions both natural and animal, and the true form of man. The Antients have endevoured to expres the obscure sence thereof by many descriptions. For they have called it a celestiall spirit, and a superior, incorporal, invisible, an immortal essence, which is to bee comprehended of its self alone, that is, of the minde or understanding. Others have not doubted but that wee have our souls inspired by the universal divine minde, which as they are alive, so they do bestow life on the bodies unto whom they are annexed or united. And although this life bee dispersed into all the whole bodie, and into everie portion of the same, yet is it void of all corporal weight or mixtion, and it is wholly and alone in everie several part, beeing simple and invisible, without all composition or mixture, yet endued with manie virtues and faculties; which it doth What the soul or life is. The life is in all the whole bodie, and in everie portion thereof. The life or soul is simple and indivisible

doth utter in divers parts of the bodie: For it feeleth, imagineth, judgeth, remembreth, underſtandeth, and ruleth all our deſires, pleaſures, and animal motions; it ſee'th, heareth, ſmelleth, taſteth, toucheth: and it hath divers names of theſe ſo manie and ſo great functions, which it performeth in divers parts of the bodie. It is called the *ſoul* or *life*; becauſ it maketh the bodie live, which of it ſelf is dead. It is called the *ſpirit* or *breath*; becauſ it inſpireth our bodies. It is called *reaſon*; becauſ it diſcerneth truth from falſhood, as it were by a certain divine rule. It is termed the *minde*; becauſ it is mindeful of things paſt, in re-calling and remembring them: And it is called the *vigor* or *courage*; becauſ it giveth vigor and courage to the ſluggiſh weight, or maſs of the bodie. And laſtly, it is called the *ſenſ* and *underſtanding*; becauſ it comprehendeth things that are ſenſible and intelligible. Becauſ it is incorporeal, it cannot occupie a place by corporeal extenſion; although notwithſtanding it filleth the whole bodie. It is *ſimple*; becauſ it is but one in eſſence, not increaſed, nor diminiſhed: for it is no leſs in a Dwarf then in a Giant; and it is like perfect and great in an infant as in a man, according to its own nature.

Divers names, and the reaſon of divers names that are given to humane forms.

But there are three kindes of bodies informed by a ſoul whereby they live: the firſt beeing the moſt imperfect, is of plants; the ſecond of brute beaſts; and the third of men. The plants live by a vegetative; beaſts by a ſenſitive; and men by an intellective ſoul. And as the ſenſitive ſoul of brute beaſts is endued with all the virtues of the vegetative; ſo the humane intellective comprehendeth the virtues of all the inferior, not ſeparated by anie diviſion, but by beeing indiviſibly united with reaſon and underſtanding, into one humane form and ſoul whereon they depend. But becauſ wee have ſaid a little before, that divers functions of the life are reſident, and appear in divers parts of the bodie here in this place, omitting all others, wee will proſecute thoſe onely which are accounted the principal.

Three kindes of liveing bodies.

The ſuperior ſoul containeth in it ſelf all the powers of the inferior.

The principal functions of an humane ſoul, according to the opinion of manie, are four in number, proceeding from ſo manie faculties, and conſequently from one ſoul; they are theſe: The Common Senſ, Imagination, Reaſoning, and Memorie. And they think that the common or interior ſenſ doth receiv the forms and images of ſenſible things, beeing carried by the ſpirit through the paſſage of the nervs, as an inſtrument of the external ſenſes, as it were a meſſenger to go between them; and it ſerv's not onely to receiv them, but alſo to know, perceiv, and diſcern them. For the eie, wherein the external ſenſ of ſeeing conſiſteth, doth not know white or black. Therefore it cannot diſcern the differences of colors, as neither the tongue taſte's, nor the noſe ſavor's, nor the ears ſound, nor laſtly, the hands their touching qualitie: yea, the eie doth not of it ſelf perceiv that it ſee'th, nor the noſe that it ſmelleth, nor the ears that they hear, nor the tongue that it taſteth, nor the hands that they touch. For all theſe things are the offices and functions of the common ſenſ; for this ſenſ knoweth that the eie hath ſeen ſom thing, either white, black, red, a man, horſ, ſheep, or ſom ſuch like material thing; yea, even when the ſight is gon and paſt; and ſo likewiſe the noſe to have ſmelled this or that ſavor, the ear to have heard this or that ſound, the tongue to have taſted this or that taſte, and the hand to have touched this or that thing, bee they never ſo divers. For all the external ſenſes, and all the functions thereof do end, and are referred to the Common ſenſ, as it were the lines of a circle from the circumference into the center, as it is expreſſed in this figure.

What the common ſenſ. The function of the common ſenſ is double.

For which cauſ it is called the common or principal ſenſ; for that therein the primitive power of feeling or perceiving is ſituated, for it uſeth the miniſterie or ſervice of the external ſenſes, to know manie and divers things, whoſe differences it doth diſcern and judg; but ſimple things, that are of themſelvs, and without anie compoſition and connexion, which may conſtitute anie thing true or falſ, or anie argumentation, belongeth onely to the minde, underſtanding, or reaſon. For this was the counſel of nature, that the external ſenſes ſhould receiv the forms of things ſuperficially, lightly, and gently onely; like as a glaſs, not to anie other end, but that they ſhould preſently ſend them unto the Common ſenſ, as it were unto their center and prince, which bee (that is to ſay, the Common ſenſ) delivereth to bee collected unto the underſtanding or reaſoning faculty of the ſoul, which *Avicen* and *Averroës* have ſuppoſed to bee ſituated in the former part of the brain.

For what cauſ the internal ſenſ is called the common ſenſ. The common ſenſ underſtandeth or knoweth thoſe things that are ſimple onely.

Next unto the common ſenſ followeth the phantaſie or imagination, ſo called, becauſ of it ariſe the forms and *Idea's* that are conceived in the minde, called of the Greeks *Phantaſmata*.

What imagination is.

Phantaſmata. This doth never reſt but in thoſe that ſleep: neither alwaies in them, for oft-times in them it cauſſeth dreams, and cauſeth them to ſuppoſe they ſee and perceiv ſuch things as were never perceived by the ſenſes, nor which the nature of things, nor the order of the world will permit. The power of this faculty of the minde is ſo great in us, that it often bringeth the whole bodie in ſubjection unto it.

For it is recorded in hiſtorie, that *Alexander* the Great ſitting at Table, and hearing *Timotheus* the Muſician ſing a Martial ſonnet unto his Cythern, that hee preſently leaped from the table, and called for arms; but when again the Muſician mollified his tune, hee returned to the table and ſate down as before. The power of imagination cauſſed by muſical harmonie, was ſo great, that it ſubjected to it the courage of the World's conqueror, by whoſe various motion, it would now as it were cauſ him to run headlong to arms, and then pacifie and quiet him, and ſo cauſ him to return to his chair and banquetting again. And there was one whoſoever it was, who ſom few years agon, ſeeing the Turk dance on a rope on high, with both his feet faſtned in a baſin, turned his eies from ſo dangerous a ſight or ſpectacle, although came of purpoſe to ſee it, and ſtricken with ſuch fear, that his bodie ſhook and heart quaked, for fear leſt that by ſudden falling down headlong hee ſhould break his neck. Manie looking down from an high and loftie place, are ſo ſtricken with fear, that ſuddenly they fall down headlong, beeing ſo overcom and bound with the imagination of the danger, that their own ſtrength is not able to ſuſtain them. Therefore it manifeſtly appeareth that God hath dealt moſt graciouſly and loveingly with us, who unto this power of imagination, hath joined another, that is, the facultie or power of reaſon and underſtanding; which diſcerning falſ dangers and perils from true, doth ſuſtain and hold up a man that hee may not bee overthrown by them.

After this appeareth and approacheth to perform his function, the facultie of Reaſon, beeing the Prince of all the principal faculties of the ſoul; which bringeth together, compoſeth, joineth, and reduceth all the ſimple and divided forms or images of things into one heap, that by divideing, collecting, and reaſoning it might diſcern and trie truth from falſhood. What Reaſon is.

This facultie of Underſtanding or Reaſon is ſubject to no facultie or inſtrument of the bodie, but is free, and penetrateth into everie ſecret, intricate and hidden thing with an incredible celeritie: by which a man ſee'th what will follow, perceiveth the originals and cauſſes of things, is not ignorant of the proceedings of things; hee compareth things that are paſt with thoſe that are preſent and to com, decreeing what to follow, and what to avoid. This bridleth and with-holdeth the furious motions of the minde, bridleth the overhaſtie motions of the tongue, and admoniſheth the ſpeaker that before the words paſs out of his mouth, hee ought with diligence and diſcretion to ponder and conſider the thing whereof hee is about to ſpeak. The functions of Reaſon.

After Reaſon and Judgment followeth Memorie, which keeping and conſerving all forms and images that it receiveth of the ſenſes, and which Reaſon ſhall appoint, and as a faithful keeper and conſerver, receiveth all things, and imprinteth and ſealeth them as well by their own virtue and power, as by the impulſion and adherence of thoſe things in the bodie of the brain, without anie impreſſion of the matter; that when occaſion ſerveth, wee may bring them forth there-hence as out of a treaſurie or ſtore-houſ. For otherwiſe, to what purpoſe were it to read, hear, and note ſo manie things, unleſs wee were able to keep and retain them in minde by the care and cuſtodie of the Memorie or Brain? Therefore aſſuredly God hath given us this onely remedie and preſervative againſt the oblivion and ignorance of things, which although of it ſelf and of its own nature it bee of greater efficacie, yet by dailie and often meditation it is trimmed and made more exquiſite and perfect. And hence it was that the Antients termed wiſdom the daughter of memorie and experience. Manie have ſuppoſed that the manſion or ſeat of the Memorie, is in the hinder part, or in the ventricle of the *Cerebellum*; by reaſon that it is apt to receiv the forms of things, becauſ of the engrafted drineſs and hardneſs thereof. What memorie is. Wiſdom the daughter of memorie and experience.

CHAP. XII.

Of the natural excrements in general, and eſpecially of thoſe that the childe or infant beeing in the womb excludeth.

BEfore I declare what excrements the infant excludeth in the womb and by what paſſages, I think it good to ſpeak of the excrements which all men do naturally void. All that is called an excrement which nature is accuſtomed to ſeparate and caſt out from the laudable aud nouriſhing juice. There are manie kindes of thoſe excrements. What an excrement is.

The firſt is of the firſt concoction, which is performed in the ſtomach, which beeing driven down into the inteſtines or guts, is voided by the fundament. The excrement of the firſt concoction.

The ſecond commeth from the Liver and is uſually is three-fold, or of three kindes; one choler-

The excrement of the second concoction is triple.

cholerick, whereof a great portion is sent into the bladder of the gall, that by sweating out there-hence, it might stir up the expulsive faculties of the guts to expel and exclude the excrements. The other is like unto whay, which goeth with the blood into the veins, and is as it were a *vehicle* thereto to bring it unto all the parts of the bodie, and into everie capillar vein for to nourish the whole bodie; and after it hath performed that function, it is partly expelled by sweat, and partly sent into the bladder, and so excluded with the urine. The third is the melancholick excrement which beeing drawn by the milt, the purer and thinner part thereof goeth into the nourishment of the milt, and after the remnant is partly purged out downwards by the Hemorrhoidal veins, and partly sent to the orifice of the

The excrement of the third concoction is triple.

stomach, to instimulate and provoke the appetite. The last commeth of the last concoction, which is absolved in the habit of the bodie, and breathed out, partly by insensible transpiration, is partly consumed by sweating, and partly floweth out by the evident and manifest passages that are proper to everie part: as it happeneth in the brain before all other parts; for it doth unload it self of this kinde of excrement by the passages of the nose, mouth, ears, eies, palat-bone and sutures of the scul.

Therefore if anie of those excrements bee staied altogether, or anie longer then it is meet they should, the default is to bee amended by diet and medicine. Furthermore, there are other sorts of excrements not natural, of which wee have entreated at large in our book of the pestilence.

The use of the navel-string.

When the infant is in the mother's womb, until hee is fully and absolutely formed in all the lineaments of his bodie, hee send's forth his urine by the passage of the navel or *urachus*. But a little before the time of childe-birth, the *urachus* is closed, and then the man-childe voideth his urine by the conduit of the yard, and the woman-childe by the neck of the womb. This urine is gathered together and contained in the coat *Chorion* or *Allantoides*, together with the other excrements, that is to say, sweat, and such whayish superfluities of the

The signs of speedie and easie deliverance.

menstrual matter, for the more easie bearing up of the floteing or swimming childe. But in the time of childe-birth, when the infant by kicking breaketh the membranes, those humors run out, which when the midwives perceiv, they take it as a certain sign that the childe is at hand. For if the infant com forth together with those waters, the birth is like to bee more easie, and with the better success; for the neck of the womb and all the genitals are so by their moisture relaxed and made slipperie, that by the endevor and stirring of the infant the birth will bee more easie, and with the better succes: contrariwise, if the infant bee not excluded before all these humors bee wholly flowed out and gon, but remaineth as it were in a drie place, presently through drines the neck of the womb and all the genitals will bee contracted and drawn together, so that the birth of the childe will bee verie difficult and hard, unless the neck of the womb, to amend that default, bee annointed with oil or som other relaxing liquor. Moreover, when the childe is in the womb, hee voideth no excrements by the fundament, unless it bee when at the time of the birth, the proper membranes and receptacles are burst by the striveing of the infant, for hee doth not take his meat at the mouth, wherefore the stomach is idle then, and doth not execute the office of turning the meats into *chylus*, nor of anie other concoction; wherefore nothing can go down from

Children born without a passage in their fundament.

it into the guts. Neither have I seldom seen infants born without anie hole in their fundament, so that I have been constrained with a knife to cut in sunder the membrane or tunicle that grew over and stopped it. And how can such excrements bee engendred, when the childe beeing in the womb, is nourished with the more laudable portion of the menstrual blood? therefore the issue or childe is wont to yeeld or avoid two kindes or sorts of excrements, so long as hee is in the womb, that is to say, sweat and urine, in both which hee swim's; but they are separated by themselvs, by a certain tunicle called *Allantoides*, as it may bee seen in kids, dogs, sheep, and other brute beasts; for as much as in mankinde the tunicle

Aph. 42 *sect.* 5. *Chorion* and *Allantoides* or *Farciminalis*, bee all one membrane. If the woman bee great of a man-childe, shee is more merrie, strong, and better colored, all the time of her childe-bearing; but if of a woman-childe, shee is ill colored, becaus that women are not so hot as men.

The males begin to stir within three months and an half, but females after: if a woman conceiv a male-childe, shee hath all her right parts stronger to everie work: wherefore they do begin to set forwards their right foot first in going, and when they arise they lean on

Aph. 47 *sect.* 5. the right arm, the right dug will sooner swell and wax hard: the male-children stir more in the right side then in the left, and the female-children rather in the left then in the right side.

CHAP.

CHAP. XIII.

With what travail the Childe is brought into the world, and of the cauſe of this labor and travail.

WHen the natural prefixed and preſcribed time of childe-birth is com, the childe beeing then grown greater, require's a greater quantitie of food: which when hee cannot receiv in ſufficient meaſure by his navel, with great labor and ſtriving hee endeavoreth to get forth: therefore then hee is mooved with a ſtronger violence, and doth break the membranes wherein hee is contained. Then the womb, becauſe it is not able to endure ſuch violent motions, nor ſuſtain or hold up the childe anie longer, by reaſon that the conceptacles of the membranes are broken aſunder, is relaxed. and then the childe purſuing the air which hee feeleth to enter in at the mouth of the womb, which then is verie wide and gapeing, is carried with his head downwards, and ſo commeth into the world with great pain both unto it ſelf, and alſo unto his mother, by reaſon of the tenderneſs of his bodie, and alſo by reaſon of the nervous neck of his mother's womb, and ſeparation of the bone called *Os Ilium* from the bone called *Os ſacrum*. For unleſs thoſe bones were drawn in ſunder, how could not onely twins that cleav faſt together, but alſo one childe alone, com forth at ſo narrow a paſſage as the neck of the womb is? Not onely reaſon, but alſo experience confirmeth it; for I opened the bodies of women preſently after they have died of travail in childe-birth, in whom I have found the bones of *Ilium* to bee drawn the bredth of ones finger from *Os ſacrum*: and moreover, in manie unto whom I have been called, beeing in great extremitie of difficult and hard travail, I have not onely heard, but alſo felt the bones to cracle and make a noiſ, when I laid my hand upon the coccyx or rump, by the violence of the diſtention. Alſo honeſt matrons have declared unto mee that they themſelvs, a few daies before the birth, have felt and heard the noiſ of thoſe bones ſeparateing themſelvs one from another with great pain. Alſo a long time after the birth manie do feel great pain and ach about the region of the coccyx and *Os ſacrum*, ſo that when nature is not able to repair the diſſolved continuitie of the bones of *Ilium*, they are conſtrained to halt all the daies of their life after. But the bones of the ſhare called *Oſſa pubis*, I have never ſeen to bee ſeparated, as manie do alſo affirm. It is reported that in *Italie* the coccyx or rump in all maidens, that when they com to bee married thee may bear children with the leſſer travail in childe-birth; but this is a forged tale, for that bone beeing broken, is naturally and of its own accord repaired, and ioined together again with a *Callus*, whereby the birth of the childe will bee more difficult and hard.

Why the infant is born ſomtimes with his head forwards.

In the time of childe-birth the bones of *Ilium* and *Os ſacrum* are drawn and extended one from another.

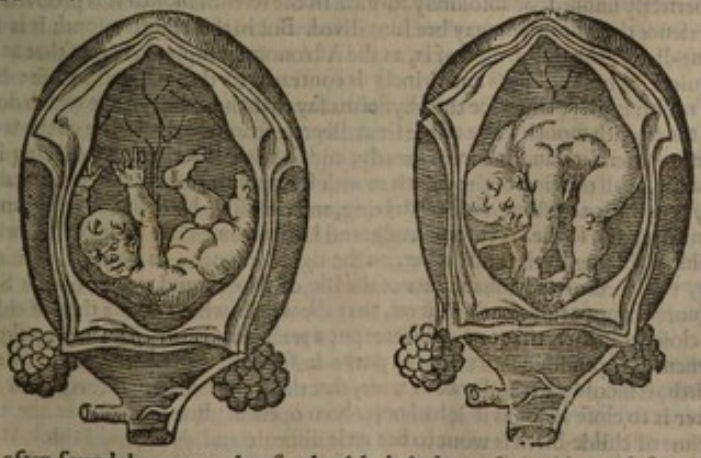
An Italian fable.

CHAP. XIV.

Of the ſituation of the infant in the womb.

REaſon cannot ſhew the certain ſituation of the infant in the womb, for I have found it altogether uncertain, variable and diverſ both in liveing and dead women: in the dead by opening their bodies preſently after they were dead; and in the liveing by helping them by the induſtrie of my hand, when they have been in danger of periſhing by travail of childe-birth: for by putting my hand into the womb, I have felt the infant conming forth, ſomtimes with his feet forwards, ſomeimes with his hands, and ſomtimes with his hands and feet turned backwards, and ſomtimes forwards as the figure following plainly deſcribeth.

The ſituation of the infant in the womb is diverſ.



I have often found them comming forth with their knees forwards, and ſomtimes with one of the feet, and ſomtimes with their bellie forwards, their hands and feet beeing lifted upwards, as the former figure ſheweth at large. *Som-*

Somtimes I have found the infant comming with his feet downwards strideing awide, and somtimes headlong, stretching one of his arms downward out at length, and that was an Hermaphrodite, as the figure following plainly declareth.

One time I observed in the birth of twins, that the one came with his head forwards, and the other with his feet, according as here I have thought good to describe them.

In the bodies of women that died in travail of childe I have somtimes found children no bigger then if they had been but four months in the womb, situated in a round compass like a hoop, with their head bowed down to their knees, with both their hands under the knees, and their heels close to their buttocks. And moreover, I protest before God that I found a childe beeing yet alive in the bodie of his mother (whom I opened so soon as shee was dead) lying all along stretched out, with his face upwards, and the palms of his hands joined together, as if hee were at praier.

CHAP. XV.

Which is the legitimate and natural, and which the illegitimate or unnatural time of childe-birth.

Mankinde hath no certain time of bringing forth young

TO all liveing creatures, except man, the time of conception and bringing forth their young is certain and definite; but the issue of man commeth into the world, somtimes in the seventh, somtimes in the eighth; and somtimes, which is most frequent, in the ninth month; somtimes in the tenth month; yea somtimes in the beginning of the eleventh month. *Massurius* report's that *Lucius Papyrius* the Pretor, the second heir commencing a suit, gave the possession of the goods away from him, seeing the mother of the childe affirmed that shee went thirteen months therewith, beeing there is no certain definite time of childe-birth. The childe that is born in the sixt month cannot bee long-lived, becaus that at that time all his bodie or members are not perfectly finished, or absolutely formed. In the seventh month it is prooved by reason and experience that the infant may bee long-lived. But in the eighth month it is seldom or never long-lived: the reason thereof is, as the Astronomers suppose, becaus that at that time Saturn ruleth, whose coldness and drines is contrarie to the original of life: but yet the physical reason is more true; for the physicians say that the childe in the womb doth oftentimes in the seventh month strive to bee set at libertie from the inclosure of the womb, and therefore it contendeth and laboreth greatly, and so with laboring amd striving it becommeth weak, that all the time of the eighth month it cannot recover his strength again, whereby it may renew his accustomed use of striving, and that som by such laboring and striving hurt themselvs, and so die. Yet som strong and lustie women are thought to bring forth their children, beeing livelie and strong, on the eighth month, as *Aristotle* testifieth of the *Egiptians*, the Poets of the inhabitants of the Isle of *Naxus*, and manie of the Spaniards. Furthermore I cannot sufficientjy marvel, that the womb, which all the time of childe-bearing is so closed together, that one can scarce put a *probe* into it, unless it bee by superfœtation, or when it is open for a short time to purge it self, that presently before the time of childe-birth, it should gape and wax so wide, that the infant may pass through it, anp presently after it to close again as if it had never been opened. But becaus that the travail of the first time of childe-birth is wont to bee verie difficult and grievous, I think it not unmeet that all women, a little before the time of their first travail, annoint and relax their privie parts with the unguent here described. ℞. *sper. ceti*, ℥ii. *ol. amigd. dul* ℥iv. *ceræ alb. & medul.*

Why the childe is scarce alive in the eighth month.

Lib. 4. de hist. anim. cap. 7.

medul. cervin. ℥iii. *axung. anſ.& gallin. an.* ℥i. *tereb. venet.* ℥ii. make thereof an ointment to annoint the thighs, ſhare, privie-parts and genitals. Furthermore, it ſhall not bee unprofitable, to make a truſs or girdle of moſt thin and gentle dog-skin, which beeing alſo annointed with the ſame unguent, may ſerv verie neceſſarily for the better carrying of the infant in the womb. Alſo baths that are made of the decoction of mollifying herbs, are alſo verie profitable to relax the privie parts a little before the time of the birth. That is ſuppoſed to bee a natural and eaſie birth, when the infant commeth forth with his head forwards, preſently following the flux of water; and that is more difficult, when the infant commeth with his feet forwards: all the other waies are moſt difficult. Therefore Mid-wives are to bee admoniſhed that as often as they perceiv the childe to bee comming forth none of thoſe waies, but either with his bellie or his back forwards, as it were double; or elſ with his hands and feet together, or with his head forwards, and one of his hands ſtretched out, that they ſhould turn it, and draw it out by the feet; for the doing whereof, if they bee not ſufficient, let them crave the aſſiſtance and help of ſom expert Chirurgian.

The natural and eaſie childbirth.

CHAP. XVI.

Signs of the birth at hand.

THere will bee great pain under the navel, and at the groins, and ſpreading therehence toward the *Vertebræ* of the loins, and then eſpecially when they are drawn back from the *Os ſacrum*, the bones *Ilia* and the *Coccyx* are thruſt outward, the genitals ſwell with pain, and a certain Fever-like ſhakeing invade's the bodie, the face waxeth red by reaſon of the endeavor of nature, armed unto the expulſion of the infant. And when theſe ſigns appear, let all things bee prepared readie to the childe-birth. Therefore firſt of all let the woman that is in travail bee placed in her bed conveniently, neither with her face upwards, nor ſitting, but with her back upwards and ſomwhat high, that ſhee may breath at more libertie, and have the more power or ſtrength to labor. Therefore ſhee ought to have her legs wide one from another, and crooked, or her heels ſomwhat bowed up towards her buttocks, ſo that ſhee may lean on a ſtaff that muſt beee placed overthwart the bed. There are ſom that do travail in a ſtool or a chair made for the ſame purpoſe: others ſtanding upright on their feet, and leaning on the poaſt or piller of the bed. But you muſt take diligent heed that you do not exhort or perſwade the woman in travail to ſtrive or labor to expel the birth before the fore-named ſigns thereof do manifeſtly ſhew that it is at hand. For by ſuch labor or pains ſhee might bee wearied or ſo weakned, that when ſhee ſhould ſtrive or labor, ſhee ſhall have no power or ſtrength ſo to do. If all theſe things do fall out well in the childe-birth, the buſineſs is to be committed to nature, and to the Midwife. And the woman with childe muſt onely bee admoniſhed that when ſhee feeleth verie ſtrong pain, that ſhee preſently therewith ſtrive with moſt ſtrong expreſſion, ſhutting her mouth and noſe if ſhee pleaſ, and at the ſame time let the Midwife with her hands force the infant from above downwards. But if the birth bee more difficult and painful, by reaſon that the waters wherein the infant lay are flown out long before, and the womb bee drie, this ointment following is to bee prepared. ℞. *butyri recentis ſine ſale in aquâ artemeſiæ loti,* ℥ii. *mucaginis ficuum, ſemin. lini & althææ, cum aquâ ſabinæ extractæ, an.* ℥ß. *olei liliorum,* ℥i. make thereof an ointment, wherewith let the Midwife often annoint the ſecret parts. Alſo this powder following may bee prepared. ℞. *Cinnamon. cort. caſſiæ fiſtul. dictamni an.* ℥iß. *ſacch. albi ad pondus omnium*: make thereof a moſt ſubtil and fine powder. Let the woman that is in extremitie by reaſon of difficult and painful travail in childe-birth, take half an ounce thereof at a time, with the decoction of lin-ſeed, or in white wine, for it will cauſ more ſpeedie and eaſie deliverance of the childe.

How the woman that travaileth in childbirth muſt bee placed in her bed.

An unction to ſupplie the defect of the waters that are flowed out too long before the birth.

A powder to cauſ ſpeedie deliverance in childe-birth.

Moreover let the midwife annoint her hands with this ointment following as often as ſhee putteth them into the neck of the womb, and therewith alſo annoint the parts about it. ℞. *olei ex ſeminibus lini,* ℥iß. *olei de caſtoreo,* ℥ß. *gallinæ moſchatæ,* ℥iii. *ladani* ℥i. make thereof a liniment. Moreover, you may provoke ſneeſing, by putting a little pepper or white Hellebore in powder into the noſtrils. Lin-ſeed beaten, and given in potion, with the water of Mugwurt and Savine, is ſuppoſed to cauſ ſpeedie deliverance. Alſo the medicine following is commended for the ſame purpoſe. ℞. *corticis caſſiæ fiſtul, conquaſſatæ* ℥ii. *cicer. rub.* mß. *bulliant cum vino albo & aquâ ſufficienti, ſub finem addendo ſabinæ,* ℥ii. *in colaturâ pro doſi adde cinam.* ℥ß. *croci gr.* vi. make thereof a potion, which beeing taken, let ſneeſing bee provoked, as it is above-ſaid, and let her ſhut or cloſe her mouth and noſtrils.

Apb. 35. & 45. *ſect.* 5. *e*

A potion cauſing ſpeedie deliverance.

Manie times it happeneth that the infant commeth into the world out of the womb, having his head covered or wrapped about with a portion of the ſecundine or tunicle wherein it is incloſed, eſpecially, when by the much, ſtrong, and happie ſtriveing of the mother, hee commeth forth together with the water wherein it lieth in the womb, and then the midwives propheſie or fore-tell that the childe ſhall bee happie, becauſ hee is born as it were with a hood on his head. But I ſuppoſe that it doth betoken health of bodie both to the infant

fant and also to his mother; for it is a token of easie deliverance. For when the birth is difficult and painful, the childe never bringeth that membrane out with him, but it remaineth behinde in the passage of the gentitals or secret parts, becaus they are narrow. For even so the Snake or Adder when shee should cast her skin thereby to renew her age, creepeth through som narrow or strait passage. Presently after birth, the woman so delivered must take two or three spoonfuls of the oil of sweet almonds extracted without fire, and tempered with sugar. Som will rather use the yelks of egs with sugar, som the wine called hypocras, others cullises or gellie: but alwaies divers things are to bee used, according as the patient or the woman in childe-bed shall bee grieved, and as the Physician shall give counsel, both to eas and asswage the furious torments and pain of the throws, to recover her strength and nourish her.

What a woman in travail must take presently after her deliverance.

The caus of the after-throws.

Throws com presently after the birth of the childe, becaus that then the veines (nature beeing wholly converted to expulsion) cast out the reliques of the menstrual matter that hath been suppressed for the space of nine months, into the womb with great violence, which becaus they are gross, slimie and dreggish, cannot com forth without great pain both to the veines from whence they com, and also unto the womb whereinto they go: also then by the conversion of that portion thereof that remaineth into winde, and by the undiscreet admission of the air in the time of the childe-birth, the womb and all the secret parts will swel, unless it bee prevented with som digesting, repelling or mollifying oil, or by artificial rowling of the parts about the bellie.

CHAP. XVII.

What is to bee don presently after the childe is born.

Why the secundine or after-birth must bee taken away presently after the birth of the childe.

PResently after the childe is born, the midwife must draw away the secundine or after-birth, as gently as shee can: but if shee cannot, let her put her hands into the womb, and so draw it out, separateing it from the other parts; for otherwise if it should continue longer, it would bee more difficult to bee gotten out, becaus that presently after the birth, the orifice of the womb is drawn together and closed, and then all the secundine must bee taken from the childe. Therefore the navel-string must bee tied with a double thred an inch from the bellie. Let not the knot bee too hard, lest that part of the navel-string which is without the knot should fall away sooner then it ought, neither too slack or loos, lest that an exceeding and mortal flux of blood should follow after it is cut off, and lest that through it (that is to say the navel-string) the cold air should enter into childes-bodie. When the knot is so made, the navel-string must bee cut in sunder the bredth of two fingers beneath it with a sharp knife. Upon the section you must applie a double linnen cloth dipped in oil of Roses, or of sweet Almonds, to mitigate the pain; for so within a few daies after, that which is beneath the knot will fall away beeing destitute of life and nourishment, by reason that the vein and arterie are tied so close, that no life nor nourishment can com unto it: commonly all midwives do let it lie unto the bare bellie of the infant, whereof commeth grievous pain and gripeing, by reason of the coldnes thereof which dieth by little and little as destitute of vital heat. But it were far better to foul it in soft cotton or lint, until it bee mortified, and so fall away.

The bindeing of the childes navel-string after the birth.

Those midwives do unadvisedly, who so soon as the infant is born do presently tie the navel-string and cut it off, not looking first for the voiding of the secundine. When all these things are don, the infant must bee wiped, cleansed and rubbed from all filth and excrement with oil of Roses or Myrtles. For thereby the pores of the skin will bee better shut, and the habit of the bodie the more strengthened.

There bee som that wash infants at that time in warm water and red wine, and afterwards annoint them with the fore-named oils. Others wash them not with wine alone, but boil therein red Roses and the leavs of Myrtles, adding thereto a little salt; and then useing this lotion for the space of five or six daies, they not onely wash away the filth, but also resolv and digest, if there bee anie hard or contused place in the infant's tender bodie, by reason of the hard travail and labor in childe-birth. Their toes and fingers must bee handled, drawn asunder and bowed, and the joints of the arms and legs must bee extended and bowed for manie daies and often; that thereby that portion of the excremental humor that remaineth in the joints, by motion may bee heated and resolved. If there bee anie default in the members, either in conformation, construction or societie with those that are adjoining to them, it must bee corrected or amended with speed. Moreover, you must look whether anie of the natural passages bee stopped, or covered with a membrane, as it often happeneth. For if anie such cover or stop the orifices of the ears, nostrils, mouth, yard or womb, it must bee cut in sunder by the Chirurgion, and the passage must bee kept open by putting in of tents, pessaries or dosels, lest otherwise they should join together again after they are cut. If hee have one finger more then hee should naturally, if his his fingers do cleav close together, like unto the feet of a Goos or Duck, if the ligamental membrane that is under the tongue bee more short and

The defaults that are commonly in children newly born.

Th: defaults of conformation must bee speedily amended.

and ſtiffer then it ought, that the infant cannot ſuck, nor in time to com, ſpeak, by reaſon thereof; and if there bee anie other thing contrarie to nature, it muſt bee all amended by the induſtrie of ſom expert Chirurgian.

Manie times in children newly born, there ſticketh on the inner ſide of their mouth and on their tongue, a certain chalkie ſubſtance, both in color and in conſiſtence; this affect proceeding from the diſtemperature of the mouth, the French-men call it the white Cancer. It will not permit the infant to ſuck, and will ſhortly breed and degenerate into ulcers that will creep into the jawes, and even unto the throat, and unleſs it bee cleanſed ſpeedily, will bee their death. For remedie whereof, it muſt bee cleanſed by deterſives, as with a linnen cloth bound to a little ſtick, and dipped in a medicine of an indifferent conſiſtence made with oil of ſweet almonds, honie and ſugar. For by rubbing this gently on it, the filth may bee mollified, and ſo cleanſed or waſhed awaie. Remedies for the Cancer in a childe's mouth.

Moreover it will bee verie meet and convenient to give the infant one ſpoonful of oil of almonds, to make his bellie loof and ſlipperie, to aſſwage the roughneſs of the weaſon and gullet, and to diſſolv the tough phlegm, which cauſſeth a cough, and ſomtimes difficultie of breathing. If the eie-lids cleav together, or if they bee joined together, or agglutinated to the coats *cornea* or *adnata*; if the waterie tumor called *hydrocephalos* affect the head, then muſt they bee cured by the proper remedies formerly preſcribed, againſt each diſeaſ.

Manie from their birth have ſpots or marks, which the common people of France call *Signes*, that is, marks or ſigns. Som of theſe are plain and equal with the skin, others are raiſed up in little tumors, and like unto warts, ſom have hairs upon them, manie times they are ſmooth, black or pale; yet for the moſt part red. When they riſe in the face, they ſpread abroad thereon manie times with great deformitie. Manie think the cauſ thereof to bee a certain portion of the menſtrual matter cleaving to the ſides of the womb, comming of a freſh flux, if happily a man do yet uſe copulation with the woman, or elſ diſtilling out of the veins into the womb, mixed and concorporated with the ſeeds at that time when they are congealed, infecting this or that part of the iſſue; beeing drawn out of the ſeminal bodie, with their own color. Women refer the cauſ thereof unto their longing when they are with childe; which may imprint the image of the thing they long for or deſire, in the childe or iſſue that is not as yet formed (as the force and power of imagination in humane bodies is verie great:) but when the childe is formed, no imagination is able to leav the impreſſion of anie thing in it, no more then it could cauſ horns to grow on the head of King *Chypus* as hee ſlept preſently after hee was returned from attentively beholding Bulls fighting together. Som of thoſe ſpots bee cureable, others not; as thoſe that are great, and thoſe that are on the lips, noſtrils, and eie-lids. But thoſe that are like unto warts, becauſ they are partakers of a certain malign qualitie and melancholick matter, which may bee irritated by indeavouring to cure them, are not to bee medled with at all, for beeing troubled and angered, they ſoon turn into a Cancer (which they call *Noli me tangere*). Thoſe that are cureable are ſmall, and in ſuch parts as they may bee dealt withall without danger. Therefore they muſt bee pierced through by the roots with a needle and a thread, and ſo beeing lifted up by the ends of the thread, they muſt bee cut awaie, and the wound that remaineth muſt bee cured according to the general method of wounds. An old fable of King *Chypus*. Which uncureable. Which and how they are cureable.

There are ſom that ſuppoſe the red ſpots that are raiſed up into little knobs and bunches, may bee waſhed awaie and conſumed by rubbing and annointing them often with menſtrual blood, or the blood of the ſecundine or after-birth. Thoſe that are hairie and ſomwhat raiſed up like unto a *Want* or Mouſ, muſt bee pierced through the roots in three or four places, and ſtraightly bound, ſo that at length beeing deſtitute of life and nutriment, they may fall awaie. after they are faln awaie, the ulcer that remaineth muſt bee cured as other ulcers are. If there bee anie ſuperfluous fleſh remaining, it muſt bee taken awaie by applying *Ægyptiacum*, or the powder of Mercurie, and ſuch like: but if it bee doubted that it commeth from the root of the tumor that may happily remain, it muſt bee burned awaie by the root with oil of vitriol or *aqua fortis*.

There is alſo an other kinde or ſort of ſpots, of a livid or violet-color, comming eſpecially in the face about the lips, with a ſoft, ſlack, lax, thin, and unpainful tumor, and the veins as if they were varicous round about it. This kinde of tumor groweth greater when it ariſeth on children that are wayward and crying, and in men of riper years that are cholerick and angrie, and then it will bee of a diverſ color, like unto a lappet or flap of fleſh that hangeth over the Turkie-cock's *bill*. When they have don crying, or ceaſed their anger, the tumor will return to his own natural color again. But you muſt not attempt to cure it in people that are of theſe conditions.

CHAP. XVIII.

How to pull awaie the secundine or after-birth.

Why it is called the secundine.

I Suppose that they are called secundines, becaus they do griev the woman that is with childe the second time, as it were a second birth: for if there bee several children in the womb at once, and of different sexes, they then have everie one their several secundines, which thing is verie necessarie to bee known by all midwives. For they do manie times remain behinde in the womb when the childe is born, either by reason of the weakness of the woman in travail, which by contending and laboring for the birth of her childe, hath spent all her strength: or elss by a tumor rising suddenly in the neck of the womb, by reason of the long and difficult birth, and the cold air unadvisedly permitted to strike into the orifice of the womb. For so the liberties of the waies or passages are stopped and made more narrow, so that nothing can com forth: or elss becaus they are doubled and foulded in the womb, and the waters gon out from them with the infant, so that they remain as it were in a drie place: or elss becaus they yet stick in the womb by the knots of the veins and arteries, which commonly happeneth in those that are delivered before their time. For even as apples which are not ripe, cannot bee pulled from the tree but by violence; but when they are ripe, they will fall off of their own accord: so the secundine before the natural time of the birth can hardly bee pulled awaie but by violence; but at the prefixed natural time of the birth, it may easily bee drawn awaie.

The causes of the staying of the secundines.

Accidents that follow the staying of the secundines.

Manie and grievous accidents follow the staying of the secundine; as suffocation of the womb, often swounding, by reason that gross vapors arise from the putrefaction unto the midriff, heart and brain: therefore they must bee pulled awaie with speed from the womb, gently handling the navel, if it may bee so possibly don. But if it cannot bee don so, the woman must bee placed as shee was wont when that the childe will not com forth naturally, but must bee drawn forth by art. Therefore the midwife having her hand annointed with oil, must put it gently into the womb, and finding out the navel-string, must follow it untill it com unto the secundine, and if it do as yet cleav to the womb by the cotylidons, shee must shake and move it gently up and down, that so when it is shaked and loosed, shee may draw it out gently; but if it should bee drawn with violence, it were to bee feared left that the womb should also follow: for by violent attraction som of the vessels, and also som of the nervous ligaments, whereby the womb is fastened on each side, may bee rent, whereof followeth corruption of blood shed out of the vessels, and thence commeth inflammation, an abscess or a mortal gangrene. Neither is there less danger of a convulsion by reason of the breaking of the nervous bodies, neither is there anie less danger of the falling down of the womb. If that there bee anie knots or clods of blood remaining together with the secundine, the Midwife must draw them out one by one, so that not anie may bee left behinde.

The manner of drawing out the secundines that remain after the birth.

The cauf of the falling down of the womb.

Som women have voided their secundine, when it could not bee drawn forth by anie meanes, long after the birth of the childe, by the neck of their womb, piece-meal, rotten and corrupted, with manie grievous and painfull accidents. Also it shall bee verie requisite to provoke the indeavor of the expulsive faculties by sternutatories, aromatick fomentations of the neck of the womb, by mollifying injections: and contrariwise, by applying such things to the nostrils as yeeld a rank savor or smell, with a potion made of mug-wort and bay-berries taken in honie and wine mixed together, or with half a dram of the powder of savin, or with the hair of a womans head, burnt and beaten to powder, and given to drink; and to conclude, with all things that provoke the tearms or courses.

The accidents that com of the violent pulling of the womb, together with the secundine.

CHAP. XIX.

What things must bee given to the infant by the mouth, before bee bee permitted to suck the teat or dug.

To draw fleam from the childe's mouth.

IT will bee verie profitable to rub all the inner side of the childe's mouth and palat gently with treacle and honie, or the oil of sweet almonds extracted without fire, and if you can, to caus it to swallow som of those things: for thereby much flegmatick moisture will bee drawn from the mouth, and also will bee mooved or provoked to bee vomited up from the stomach; for if these excremental humors should bee mixed with the milk that is sucked, they would corrupt it, and then the vapors that arise from the corrupted milk unto the brain would infer most pernicious accidents. And you may know that there are manie excremental things in the stomach and guts of children by this, becaus that so soon as they com into the world, and often before they suck milk or take anie other thing, they void downwards manie excrements diversly colored, as yellow, green, and black. Therefore manie, that they may speedily evacuate the matter that causeth the fretting of the guts, do not onely

onely minister those things fore-named, but also som laxative syrup, as that that is made of damask-Roses. But before the infant bee put to suck the mother, it is fitting to press som milk out of her breit into its mouth, that so the fibres of the stomach may by little and little accustom themselvs to draw in the milk.

Milk soon corrupted in a flegmatick stomach.

CHAP. XX.

That mothers ought to nurs or give suck unto their own children.

THat all mothers would nurs their own children were greatly to bee wished: for the mother's milk is far more familiar nourishment for the infant then that of anie Nurs: for it is nothing elf but the same blood made white in the duggs, wherewith before it was nourished in the womb. For the mother ought not to give the childe suck for the space of a few daies after the birth, but first to expect the perfect expurgation and avoiding of the excremental humors. And in the mean time let her caus her breasts to bee sucked of another, or manie other children, or of som wholsom or sober maid, whereby the milk may bee drawn by little and little unto her breasts, and also by little and little purified.

The mother's milk is most familiar for the childe.

For a certain space after the birth, the milk will bee troubled, and the humors of the bodie mooved: so that by long staying in the duggs, it will seem to degenerate from its natural goodnes, as the grosnes of it is somwhat congealed, the manifeit heat in touching, and the yellow color thereof testifieth evidently. Therefore it is necessarie that others should com in place thereof when it is sucked out, wherewith the infant may bee nourished. But if the mother or the Nurs chance to take anie diseas, as a Fever, Scouring, or anie such like, let her give the childe to another, to give it suck, lest that the childe chance to take the Nurses diseases. And moreover, mothers ought to nurs their own children, becaus for the most part they are far more vigilant and careful in bringing up and attending their children, then hired and mercenarie Nurses, which do not so much regard the infant, as the gain they shal have by the keeping of it, for the most part. Those that do not nurs their own children, cannot rightly bee termed mothers: for they do not absolutely perform the dutie of a mother unto their childe, as *Marcus Aurelius* the Roman Emperor was wont to say. For it is a certain unnatural, imperfect and half kinde of a mother's dutie, to bear a childe, and presently to abandon or put it awaie as if it were forsaken: to nourish and feed a thing in their womb (which they neither know nor see) with their own blood, and then not to nourish it when they see it in the world alive, a creature or reasonable soul, now requireing the help and sustentation of the mother.

The diseas of the Nurs is participated unto the childe.

Gel. lib. 12. ca. 1.

CHAP. XXI.

Of the choice of Nurses.

MAnie husbands take such pittie on their tender wives, that they provide Nurses for their children, that unto the paines that they have sustained in bearing them, they may not also add the trouble of nursing them: wherefore such a Nurs must bee chosen which hath had two or three children. For the duggs which have been alreadie sucked and accustomed to bee filled, have the veines and arteries more large and capable to receiv the more milk. In the choice of a Nurs there is ten things to bee considered verie diligently. as, her age, the habit of her bodie, her behaviour, the condition of her milk, the form, not onely of her duggs or breasts, but also of her teats or nipples, the time from her childe-birth, the sex of her last infant or childe, that shee bee not with childe, that shee bee sound and in perfect health. As concerning her age; shee ought not to bee under twentie five years, nor above thirtie five: the time that is between is the time of strength, more temperate, and more wholsom and healthie, and less abounding with excremental humors. And becaus her bodie doth not then grow or increas, shee must of necessitie have the more aboundance of blood. After thirtie five years in manie the menstrual fluxes do ceas, and therefore it is to bee supposed that they have the less nutriment for children.

The best age of a Nurs.

The Nurs must also bee of a good habit, or square or wel-set bodie, her breast broad, her color lively, not fat, nor lean, but well-made, her flesh not soft and tender, but thick, and hard or strong, whereby shee may bee the more able to indure watching and taking of pains about the childe; shee must not have a red or freckled face, but brown or somwhat shadowed or mixed with rednes: for truly such women are more hot then those that are red in the face, by reason whereof they must needs concoct and turn their meat the better into blood. For according to the judgment of *Sextus Cheronensis*, as blackish or brown ground is more fertil then the white: even so a brown woman hath more store of milk. You must look wel on her head, lest shee should have the scurf or running sores; see that her teeth bee not foul

The best habit of bodie in a Nurs.

Lib. de inf. natu.

foul or rotten, nor her breath ſtinking, nor no ulcer nor ſore about her bodie, and that ſhee bee not born of goutie or leprous Parents.

Of what behavior the Nurſ muſt bee.

Shee ought to bee quick and diligent in keeping the childe neat and clean, chaſte, ſober, merrie, alwaies laughing and ſmiling on her Infant, often ſinging unto it, and ſpeaking diſtinctly and plainly, for ſhee is the onely Miſtreſs to teach the childe to ſpeak. Let her bee wel-mannered, becauſ the manners of the Nurſ are participated unto the Infant together with the milk. For the whelps of dogs, if they do ſuck Wolves or Lioneſſes, will becom more fierce and cruel then otherwiſe they would. Contrariwiſe, the Lions whelps wil leave their ſavagneneſs and fierceneſs, if that they bee brought up and nouriſhed with the milk of anie Bitch, or other tame beaſt. If a Goat give a Lamb ſuck, the ſame Lamb's-wooll will bee more hard then others: contrariewiſe, if a Sheep give a Kid ſuck, the ſame Kids hair will bee more ſoft then another Kid's-hair. Shee ought to bee ſober, and the rather for this cauſ, becauſ manie Nurſes beeing overloaden with wine and banqueting, often ſet their children unto their breaſts to ſuck, and then fall aſleep, and ſo ſuddenly ſtrangle or choak them.

Why the Nurſ muſt abſtain from copulation.

Shee muſt abſtain from copulation: for copulation troubleth and mooveth the humors and the blood, and therefore the milk it ſelf; and it diminiſheth the quantitie of milk, becauſ it provoketh the menſtruall flux, and cauſeth the milk to have a certain ſtrong and virous qualitie, ſuch as wee may perceiv to breath from them that are incenſed with the fervent luſt and deſire of venerie. And moreover, becauſ that thereby they may happen to bee with childe, whereof inſueth diſcommoditie both to her own childe that is within her bodie, and alſo to the nurſ-childe: to the nurſ-childe, becauſ that the milk that it ſucketh will bee worſ and more depraved then otherwiſe it would bee, by reaſon that the more laudable blood after the conception remaineth about the womb, for the nutriment and increaſing of the infant in the womb; and the more impure blood goeth into the dugs, which breedeth impure or unclean milk: but to the conceived childe, becauſ it will cauſ it to have ſcarcitie of food; for, ſo much as the ſucking-childe ſucketh, ſo much the childe conceived in the womb wanteth.

What dugs a Nurſ ought to have.

Alſo ſhee ought to have a broad breaſt, and her dugs indifferently big, not ſlack or hanging, but of a middle conſiſtence, between ſoft and hard; for ſuch dugs will concoct the blood into milk the better, becauſ that in firm fleſh the heat is more ſtrong and compact. You may by touching trie whether the fleſh bee ſolid and firm, as alſo by the diſperſing of the veines, eaſily to bee ſeen by reaſon of their ſwelling and blewneſs, through the dugs, as it were into manie ſtreams or little rivelets; for in fleſh that is looſ and ſlack, they lie hidden. Thoſe dugs that are of a competent bigneſs, receiv or contain no more milk then is ſufficient to nouriſh the infant. In thoſe dugs that are great and hard, the milk is as it were ſuffocated, ſtopped or bound in, ſo that the childe in ſucking can ſcarce draw it out. and moreover, if the dugs bee hard, the childe putting his mouth to the breaſt, may ſtrike his noſe againſt it, and ſo hurt it, whereby hee may either refuſe to ſuck, or if hee doth proceed to ſuck, by continual ſucking, and placeing of his noſe on the hard breaſt, it may becom flat, and the noſtrils turned upwards, to his great deformitie, when hee ſhall com to age. If the teates or nipples of the dugs do ſtand ſomwhat low or depreſſed inwards on the tops of the dugs, the childe can hardly take them between its lips, therefore his ſucking will bee verie laborious. If the nipples or teates bee verie big, they will ſo fill all his mouth, that hee cannot well uſe his tongue in ſucking or in ſwallowing the milk.

What is to bee obſerved in the milk.

Wee may judg of or know the nature and condition of the milk, by the quantitie, qualitie, color, ſavor and taſte; when the quantitie of the milk is ſo little, that it will not ſuffice to nouriſh the infant, it cannot bee good and laudable; for it argueth ſom diſtemperature either of the whole bodie, or at leaſt of the dugs, eſpecially a hot and drie diſtemperature. But when it ſuperaboundeth, and is more then the infant can ſpend, it exhauſteth the juice of the Nurſes bodie; and when it cannot all bee drawn out by the infant, it cluttereth, and congealeth or corrupteth in the dugs. Yet I would rather wiſh it to abound, then to bee defective, for the ſuperabounding quantitie may bee preſſed out before the childe bee ſet to the breaſt.

The laudable conſiſtence of milk.

That milk that is of a mean conſiſtence between thick and thin, is eſteemed to bee the beſt. For it betokeneth the ſtrength and vigor of the faculties that ingendereth it in the breaſts. Therefore if one drop of the milk bee laid on the nail of ones thumb, beeing firſt made verie clean and fair, if the thumb bee not mooved, and it run off the nail, it ſignifieth that it is waterie-milk: but if it ſtick to the nail, although the end of the thumb bee bowed downwards, it ſheweth that it is too groſs and thick: but if it remain on the nail ſo long as you hold it upright, and fall from it when you hold it a little aſide or downwards by little and little, it ſheweth it is verie good milk. And that which is exquiſitely white, is beſt of all. For the milk is no other thing then blood made white.

Why the milk ought to bee verie white.

Therefore, if it bee of anie other color, it argueth a default in the blood: ſo that if it bee brown, it betokeneth melancholick blood; if it bee yellow, it ſignifieth cholerick blood; if it it bee wan and pale, it betokeneth phlegmatick blood; if it bee ſomwhat red, it argueth the weakneſs

weakneſs of the facultie that engendreth the milk. It ought to bee ſweet, fragrant, and pleaſant in ſmell; for if it ſtrike into the noſtrils with a certain ſharpneſs, as for the moſt part the milk of women that have red hair and little freckles on their faces doth, it prognoſticates a hot and cholerick nature: if with a certain ſowerneſs, it portendeth a cold and melancholick nature. In taſte it ought to bee ſweet, and as it were ſugered, for the bitter, ſaltiſh, ſharp, and ſtiptick, is naught. And here I cannot but admire the providence of nature, which hath cauſſed the blood wherewith the childe ſhould bee nouriſhed to bee turned into milk: which unleſs it were ſo, who is hee that would not turn his face from, and abhor ſo grievous and terrible a ſpectacle of the childes mouth ſo imbrued and beſmeared with blood? What mother or Nurſ would not bee amazed at everie moment with the fear of the blood ſo often ſhed out, or ſucked by the infant for his nouriſhment? Moreover, wee ſhould want two helps of ſuſtentation, that is to ſay, Butter and Cheeſ.

Why a woman that hath red hair, or freckles on her face cannot bee a good Nurſ.

Neither ought the childe to bee permitted to ſuck within five or ſix daies after it is born, both for the reaſon before alledged, and alſo becauſ hee hath need of ſo much time to reſt quiet, and eaſ himſelf after the pains hee hath ſuſtained in his birth: in the mean ſeaſon the mother muſt have her breaſts drawn by ſom maid that drinketh no wine, or elſ ſhee may ſuck or draw them her ſelf with an artificiall inſtrument which I will deſcribe hereafter.

That Nurſ that hath born a man childe is to bee preferred before another, becauſ her milk is the better concocted, the heat of the male-childe doubling the mother's heat. And moreover, the women that are great with childe of a male-childe, are better colored, and in better ſtrength, and better able to do anie thing all the time of their greatneſs, which proov-eth the ſame: and moreover the blood is more laudable, and the milk better. Furthermore, it behooveth the Nurſ to bee brought on bed, or to travail at her juſt and prefixed or natural time: for when the childe is born before his time of ſom inward cauſ, it argueth that there is ſom default lurking and hidden in the bodie and humors thereof.

Why that Nurſ that hath born a man-childe is to bee preferred before another.

Why ſhee cannot bee a good Nurſ whoſe childe was born before the time.

CHAP. XXII.

What diet the Nurſ ought to uſe, and in what ſituation ſhee ought to place the infant in the Cradle.

BOth in eating, drinking, ſleeping, watching, excerciſing and reſting, the Nurſes diet muſt bee divers, according as the nature of the childe both in habit and temperature ſhall bee: as for example, if the childe bee altogether of a more hot blood, the Nurſ both in feeding and ordering her ſelf ought to follow a cooling diet. In general, let her eat meats of good juice, moderate in quantitie and qualitie, let her live in a pure and clear air, let her abſtain from all ſpices, and all ſalted and ſpiced meats, and all ſharp things, wine, eſpecially that which is not allayed or mixed with water, and carnal copulation with a man, let her avoid all perturbations of the minde, but anger eſpecially, let her uſe moderate exerciſe, unleſs it bee the exerciſe of her armes and upper parts, rather then the leggs and lower parts, whereby the greater attraction of the blood, that muſt bee turned into milk, may bee made towards the dugs. Let her place her childe ſo in the Cradle that his head may bee higher then all the bodie, that ſo the excremental humors may bee the better ſent from the brain unto the paſſages that are beneath it. Let her ſwathe it ſo as the neck and all the back-bone may bee ſtraight and equal. As long as the childe ſucketh, and is not fed with ſtronger meat, it is better to lay him alwaie on his back, then anie other waie, for the back is, as it were the Keel in a ſhip, the ground-work and foundation of all the whole bodie, whereon the infant may ſafely and eaſily reſt, But if hee lie on the ſide, it were danger leſt that the bones of the ribs beeing ſoft and tender, not ſtrong enough, and united with ſlack bands, ſhould bow under the weight of the reſt, and ſo wax crooked, whereby the infant might becom crook-backed. But when hee beginneth to breed teeth, and to bee fed with more ſtrong meat, and alſo the bones and connexions of them begin to wax more firm and hard, hee muſt bee laied one while one this ſide, another while on that, and now and then alſo on his back. And the more hee groweth, the more let him bee accuſtomed to lie on his ſides; and as hee lieth in the Cradle, let him bee turned unto that place whereat the light commeth in, leſt that otherwiſe hee may becom purblinde, for the eie of its own nature is bright and light-ſom, and therefore alwaies deſireth the light, and abhoreth darkneſs, for all things are moſt delighted with their like, and ſhun their contraries. Therefore vnleſs the light com's directly into the childe's face, hee turneth himſelf everie waie beeing verie ſorrowful, and ſtriveth to turn his head and eies that hee may have the light; and that often turning and rowling of his eies at length groweth into a cuſtom that cannot bee left: and ſo it commeth to paſs that the infant doth either becom pur-blind, if hee ſet his eies ſtedfaſtly on one thing, or elſ his eies do becom trembling, alwaies turning and unſtable, if hee caſt his eies on manie things that are round about him: which is the reaſon that Nurſes, beeing taught by experience, cauſ over the head of the childe lying in the Cradle, an arch or vault of Wickers covered with cloath to bee made, thereby to reſtrain, direct, and eſtabliſh the uncertain and wandering motions of the childe's eies.

Anger greatly hurteth the Nurſ.

The exerciſe of the armes is beſt for the Nurſ. How the childe ſhould bee placed in the Cradle.

Why an arch of wickers muſt bee made over the childe's head lying in the Cradle.

Why a squint-eied Nurs causseth the childe to bee squint-eied.

If the Nurs bee squint-eied, shee cannot look upon the childe but side-waies, whereof it commeth to pass that the childe beeing moist, tender, flexible, and prone to anie thing with his bodie, and so likewise with his eie, by a long and dailie custom unto his Nurse's sight, doth soon take the like custom to look after that sort also, which afterwards hee cannot leav or alter. For those evil things that wee learn in our youth, do stick firmly by us; but the good qualities are easily changed into worse. In the eies of those that are squint-eied, those two muscles which do draw the eies to the greater or lesser corner, are chiefly or more frequently mooved. Therefore either of these beeing confirmed in their turning aside by long use, as the exercise of their proper office increaseth the strength, soon overcom's the contrarie or withstanding muscles, called the *Antagonists*, and bring's them into their subjection, so that, will they, nill they, they bring the eie unto this or that corner as they list.

How children becom left-handed.

So children becom left-handed, when they permit their right hand to languish with idleness and sluggishness, and strengthen their left hand with continual use and motion to do everie action therewithall, and so bring by the exercise thereof more nutriment unto that part. But if men (as som affirm) beeing of ripe years, and in their full growth, by dailie societie and companie of those that are lame and halt do also halt, not mindeing so to do, but it commeth against their wills, and when they think nothing thereof, why should not the like happen in children, whose soft and tender substance is as flexible and pliant as wax unto everie impression? Moreover, children, at they becom lame and crook-back't; so do they also becom squint-eied by the hereditarie default of their parents.

CHAP. XXIII.

How to make pap for children.

Three laudable conditions of pap.

How the meal must bee prepared to make the pap withall.

Why the meal wherewith the pap must bee made, must first bee boiled or baked.

PAp is a most meet food or meat for children; becaus they require moist nourishment, and it must bee answerable in thickness to the milk, that so it may not bee difficult to bee concocted or digested. For pap hath these three conditions, so that it bee made with wheaten flower, and that not crude, but boiled: let it bee put into a new earthen pot or pipkin, and so set into an oven at the time when bread is set thereinto to bee baked; and let it remain there until the bread bee baked and drawn out: for when it is so baked, it is less clammie and crude. Those that mix the meal crude with the milk, are constrained to abide one of these discommodities or other, either to give the meal gross and clammie unto the childe, if that the pap bee onely first boiled over the fire in a pipkin or skellet, so long as shall bee necessarie for the milk; hence com obstructions in the mesaraick veins, and in the small veins of the liver, fretting and worms in the guts, and the stone in the reins. Or elss they give the childe the milk, despoiled of its butterish and whayish portion, and the terrestrial, and cheese-like, or curd-like remaining, if the pap bee boiled so long as is necessarie for the meal: for the milk requireth not so great, neither can it suffer so long boiling as the meal. Those that do use crude meal, and have no hurt by it, are greatly bound to nature for so great a benefit. But *Galen* willeth children to bee nourished onely with the Nurse's milk, so long as the Nurs hath enough to nourish and feed it. And truly there are manie children that are contented with milk onely, and will receiv no pap until they are three months old. If the childe at anie time bee costive, and cannot void the excrements, let him have a cataplasm made with one dram of Aloës, of white and black Hellebore, of each fifteen grains, beeing all incorporated in as much of an Ox gall as is sufficient, and extended or spread on Cotton like unto a *pultis*, as broad as the palm of ones hand, and so applie it upon the navel warm: Moreover, this cataplasm hath also virtue to kill the worms in the bellie. Manie times children have fretting of the guts, that maketh them to crie, which commeth of cruditie. This must bee cured by applying unto the bellie sweatie or moist wooll, macerated in oil of Camomil.

Lib. 1. de sanit. tuend.

A cataplasm to relax the childe's bellie.

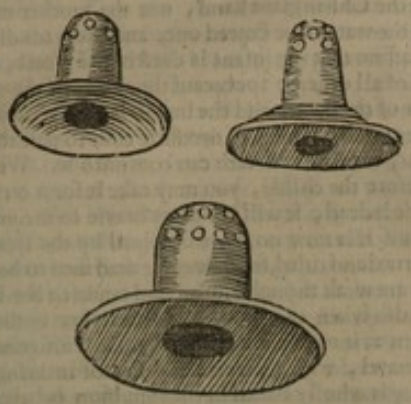
For the fretting of the guts in children.

If when the childe's teeth begin to grow, hee chance to bite the nipple of the Nurse's breast, there will bee an ulcer verie contumacious and hard to bee cured; becaus that the sucking of the childe, and the rubbing of the clothes do keep it alwaies raw; it must bee cured with fomenting it with Alum-water, and then presently after the fomentation putting thereupon a cover of lead, made like unto a hat, as they are here described, with manie holes in the top, whereat both the milk, and also the sanious matter that commeth from the ulcers may go out; for lead it self will cure ulcers.

For the ulcers of the nipples or teats.

The

The figure of leaden Nipples to bee put upon the Nipple or Teat of the Nurſ, when it is ulcerated.



Children may bee cauſſed to ceaſ their crying four manner of waies, that is to ſay, by giveing them the teat, by rocking them in a cradle, by ſinging unto them, and by changeing the clothes and ſwathes wherein they are wrapped. They muſt not bee rocked too violently in the cradle, leſt that the milk that is ſucked ſhould bee corrupted by the too violent motion, by reaſon whereof they muſt not bee handled violently anie other way, and not altogether prohibited, or not ſuffered to crie. For by crying the breaſt and lungs are dilated, and made bigger and wider; the natural parts the ſtronger, and the brain, noſtrils, the eies and mouth are purged, by the tears and filth that com from the eies and noſtrils. But they muſt not bee permitted to crie long or fiercely, for fear of breaking the production of the *Peritoneum*, and thereby cauſſing the falling down of the guts into the cod, which rupture is called of the Greeks *Enterocele*; or of the caul, which the Greeks call *Epiplocele*.

What moderate crying worketh in the infant.

What immoderate crying cauſſeth.

CHAP. XXIV.

Of the weaning of Children.

MAnie are weaned in the eighteenth month, ſom in the twentieth; but all, or the moſt part, in the ſecond year: for then their teeth appear, by whoſe preſence nature ſeemeth to require ſom harder meat then milk or pap, wherewith children are delighted, and will feed more earneſtly thereon. But there is no certain time of weaning of children. For the teeth of ſom will appear ſooner, and ſom later; for they are prepared of nature for no other purpoſe then to chaw the meat. If children bee weaned before their teeth appear, and bee fed with meat that is ſomwhat hard and ſolid, according to the judgment of *Avicen*, they are incident to manie diſeaſes comming through cruditie; becauſ the ſtomach is yet but weak, and wanteth that preparation of the meats which is made in the mouth by chawing; which men of ripe years cannot want without offence: when the childe is two years old, and the teeth appear, if the childe more vehemently deſire harder meats, and doth feed on them with pleaſure and good ſucceſs, hee may bee ſafely weaned; for it cannot bee ſuppoſed that hee hath this appetite of hard meats in vain, by the inſtinct of nature. Yet hee may not bee weaned without ſuch an appetite, if all other things bee correſpondent, that is to ſay, his teeth and age; for thoſe things are eaten without an appetite, cannot profit. But if the childe bee weak, ſicklie, or feeble, hee ought not to bee weaned. And when the meet time of weaning commeth, the Nurſ muſt now and then uſe him to the teat, whereby hee may leav it by little and little, and then let the teat bee annointed or rubbed with bitter things, as with Aloës, water of the infuſion of *Colocynthus*, or Wormwood, or with Muſtard, or Soot ſteeped in water, or ſuch like. Children that are ſcabbie in their heads, and over all their bodies, and which void much phlegm at their mouth and noſtrils, and manie excrements downwards, are like to bee ſtrong and ſound of bodie; for ſo they are purged of excremental humors: contrariwiſe, thoſe that are clean and fair of bodie, gather the matter of manie diſeaſes in their bodies, which in proceſs of time will break forth and appear. Certainly, by the ſudden falling of ſuch matters into the back-bone, may becom crook-back't.

When children muſt bee weaned.

Why children muſt not bee weaned before their teeth appear.

How children muſt bee weaned.

What children are ſtrong and ſound of bodie.

An often cauſ of ſudden crookedneſs.

CHAP.

CHAP. XXV.

By what signs it may bee known whether the childe in the womb bee dead or alive.

A moſt certain ſign of the childe dead in the womb.

IF neither the Chirurgians hand, not the mother can perceiv the infant to moov, if the waters bee flowed out, and the ſecundine com forth, you may certainly affirm that the infant is dead in the womb, for this is the moſt infallible ſign of all others: for becauſ the childe in the womb doth breath but by the arterie of the navel, and the breath is received by the *Cotyledon* of the arteries of the womb, it muſt of neceſſitie com to paſs that when the ſecundine is ſeparated from the infant, no air nor breath can com unto it. Wherefore ſo often as the ſecundine is excluded before the childe, you may take it for a certain token of the death thereof: when the childe is dead, it will bee more heavie to the mother then it was before when it was alive, becauſ it is now no more ſuſtained by the ſpirits and faculties wherewith before it was governed and ruled, for ſo wee ſee dead men to bee heavier then thoſe that are alive, and men that are weak though hunger and famin to bee heavier then when they are well refreſhed, and alſo when the mother encline's her bodie anie way, the infant falleth that way alſo even as it were a ſtone. The mother is alſo vexed with ſharp pain from the privities even to the navel, with a perpetual deſire of makeing water, and going to ſtool, becauſ that nature is wholly buſied in the expulſion or avoidance of that which is dead: for that which is alive will expel the dead ſo far as it can from it ſelf, becauſ the one is altogether different from the other; but likeneſs, if anie thing, conjoin's and unite's things together: the genitals are cold in touching, and the mother complaineth that ſhee feeleth a coldneſs in her womb, by reaſon that the heat of the infant is extinguiſhed, wherewith before her heat was doubled: manie filthie excrements com from her, and alſo the mother's breath ſtinketh, ſhee ſwoundeth often, all which for the moſt part happen within three daies after the death of the childe: for the infant's bodie will ſooner corrupt in the mother's womb then it would in the open air, becauſ that, according to the judgment of *Galen*, all hot and moiſt things, beeing in like manner encloſed in a hot and moiſt place, eſpecially if by reaſon of the thickneſs or ſtraitneſs of the place they cannot receiv the air, will ſpeedily corrupt. Now by the riſeing up of ſuch vapors from the dead unto the brain and heart, ſuch accidents may ſoon follow, her face will bee clean altered, ſeeming livid and ghaſtly, her dugs fall and hang looſ and lank, and her bellie will bee more hard and ſwollen then it was before. In all bodies ſo putrefying, the natural heat vaniſheth away, and in place thereof ſucceedeth a preternatural, by the working whereof the putrefied and diſſolved humors are ſtirred up into vapors, and converted into winde, and thoſe vapors, becauſ they poſſeſs and fill more ſpace and room (for naturaliſts ſay that of one part of water ten parts of air are made) do ſo puff up the putrefied bodie into a greater bigneſs. You may note the ſame thing in bodies that are gangrenate, for they caſt forth manie ſharp vapors, yet nevertheleſs they are ſwollen and puffed up.

When the childe is dead in the womb hee is more heavie then hee was before beeing alive.

That which is alive will not ſuffer that which is dead.

Lib. de tumorib.

Why the bellie of a woman will bee more big when the childe is dead within her then it was before when it was alive.

Now ſo ſoon as the Chirurgian ſhall know that the childe is dead by all theſe fore-named ſigns, hee ſhall with all diligence endeavor to ſave the mother ſo ſpeedily as hee can, and if the Phyſicians cannot prevail with potions, baths, fumigations, ſternutatories, vomits, and liniments appointed to expel the infant, let him prepare himſelf to the work following; but firſt let him conſider the ſtrength of the woman, for if hee perceiv that ſhee bee weak and feeble by the ſmalneſs of her pulſ, by her ſmall, ſeldom and cold breathing, and by the altered and death-like color in her face, by her cold ſweats, and by the coldneſs of the extreme parts, let him abſtain from the work, and onely affirm that ſhee will die ſhortly; contrariwiſe, if her ſtrength bee yet good, let him with all confidence and induſtrie deliver her on this wiſe from the danger of death.

The ſigns of a woman that is weak.

CHA XXVI.

Of the Chirurgical extractions of the childe from the womb either dead or alive.

After what ſort the woman in travail muſt bee placed when the child beeing dead in her womb, muſt bee drawn out.

THerefore firſt of all the air of the chamber muſt bee made temperate, and reduced unto a certain mediocritie, ſo that it may neither bee too hot nor too cold. Then ſhee muſt bee aptly placed, that is to ſay, overthwart the bed-ſide, with her buttocks ſomwhat high, haveing a hard ſtuffed pillow or bouſter under them, ſo that ſhee may bee in a mean figure of ſituation, neither ſitting altogether upright, nor altogether lying along on her back; for ſo ſhee may reſt quietly, and draw her breath with eaſ, neither ſhall the ligaments of the womb bee extended ſo as they would if ſhee lay upright on her back, her heels muſt bee drawn up cloſe to her buttocks, and there bound with broad and ſoft linnen rowlers. The rowler muſt firſt com about her neck, and then croſ-wiſe over her ſhoulders, and ſo to the feet, and there it muſt croſs again, and ſo bee rowled about the legs thighs, and then it muſt bee brought up to the neck again, and there made faſt, ſo that ſhee

How ſhee muſt bee bound.

may

may not bee able to moov her ſelf,even as one ſhould be tied when he is to bee cut of the ſtone. But that ſhee may not bee wearied, or left that her bodie ſhould yeeld or ſink down as the Chirurgian draweth the bodie of the infant from her, and ſo hinder the work, let him cauſ her feet to bee ſet againſt the ſide of the bed, and then let ſom of the ſtrong ſtanders by hold her faſt by the legs and ſhoulders. Then that the air may not enter into the womb, and that the work may bee don with the more decencie, her privie parts and thighs muſt bee covered with a warm double linnen cloth. Then muſt the Chirurgian,haveing his nails cloſely pared, and his rings (if hee wear anie) drawn off his fingers, and his arms naked,bare, and well annointed with oil, gently draw the flaps of the neck of the womb aſunder, and then let him put his hand gently into the mouth of the womb, haveing firſt made it gentle and ſlipperie with much oil; and when his hand is in, let him finde out the form and ſituation of the childe, whether it bee one or two, or whether it bee a Mole or not. And when hee findeth that hee commeth naturally, with his head toward the mouth or orifice of the womb, hee muſt lift him up gently, and ſo turn him that his feet may com forwards, and when hee hath brought his feet forwards, hee muſt draw one of them gently out at the neck of the womb, and then hee muſt binde it with ſom broad and ſoft or ſilken band a little above the heel with an indifferent ſlick knot, and when hee hath ſo bound it, hee muſt put it up again into the womb, then hee muſt put his hand in again, and finde out the other foot, and draw it alſo out of the womb, and when it is out of the womb, let him draw out the other again whereunto hee had before tied the one end of the band, and when hee hath them both out, let him join them both cloſe together, and ſo by by little and little let him draw all the whole bodie from the womb. Alſo other women or Midwives may help the endeavor of the Chirurgian, by preſſing the patient's bellie with their hands downwards as the infant goeth out: and the woman herſelf by holding her breath, and cloſeing her mouth and noſtrils,and by driveing her breath downwards with great violence, may verie much help the expulſion. I wiſh him to put back the foot into the womb again after hee hath tied it, becauſ if that hee ſhould permit it to remain in the neck of the womb, it would hinder the entrance of his hand when hee putteth it in to draw out the other. But if there bee two children in the womb at once, let the Chirurgian take heed leſt that hee take not of either of them a leg, for by drawing them ſo, hee ſhall profit nothing at all, and yet exceedingly hurt the woman. Therefore that hee may not bee ſo deceived, when hee hath drawn out one foot and tied it, and put it up again,let him with his hand follow the band wherewithall the foot is tied,and ſo go unto the foot, and then to the groin of the childe and then from thence hee may ſoon finde out the other foot of the ſame childe:for if it ſhould happen otherwiſe, hee might draw the legs and the thighs out: but it would com no further, neither is it meet that hee ſhould com out with his arms along by his ſides, or bee drawn out on that ſort, but one of his arms muſt bee ſtretched out above his head, ond the other down by his ſide, for otherwiſe the orifice of the womb when it were delivered of ſuch a groſs trunk, as it would bee when his bodie ſhould bee drawn out with his arms along by his ſides, would ſo ſhrink and draw it ſelf when the bodie ſhould com unto the neck, onely by the accord of nature requiring union, that it would ſtrangle and kill the infant, ſo that it cannot bee drawn there-hence unleſs it bee with a hook put under, or faſtned under his chin, in his mouth, or in the hollowneſs of his eie. But if the infant lieth as if hee would com with his hands forwards, or if his hands bee forth alreadie, ſo that it may ſeem hee may bee drawn forth eaſily that way, yet it muſt not bee ſo don; for ſo his head would double backwards over his ſhoulders, to the great danger of his mother. Once I was called unto the birth of an infant, whom the midwives had aſſaied to draw out by the arm, ſo that the arm had been ſo long forth that it was gangrenate,whereby thechilde died;I told them preſently that his arm muſt bee put in again, and hee muſt bee turned otherwiſe. But when it could not bee put back by reaſon of th e great ſwelling thereof, and alſo of the mother's genitals, I determined to cut it off with an inciſion knife, cutting the muſcles as near as I could to he ſhoulder, yet drawing the fleſh upwards,that when I had taken off the bone with a pair tof cutting pincers, it might com down again to cover the ſhivered end of the bone, leſt otherwiſe when it were thruſt in again into the womb, it might hurt the mother. Which beeing don, I turned him with his feet forwards, and drew him out as is before ſaid. But if the tumor either naturally or by ſom accident, that is to ſay, by putrefaction, which may perchance com, bee ſo great that hee cannot bee turned according to the Surgeon's intention, nor bee drawn out according as hee lieth, the tumor muſt bee diminiſhed, and then hee muſt bee drawn out as is afore-ſaid, and that meſt bee don at once. As for example, if the dead infant appear at the orifice of the womb, which our midwives call the Garland, when it gapeth, is open and dilated, but yet his head beeing more great and puffed up with winde ſo that it cannot com forth, as cauſſed to bee ſo through that diſeaſ which the Greeks call *Mucrophiſocephalos*, the Surgeon muſt faſten a hook under his chin, or in his mouth, or elſ in the hole of his eie, or elſ, which is better and more expedient, in the hinder part of his head. For when the ſcull is ſo opened there will bee a paſſage whereat the winde may paſs out, and ſo when the tumor falleth and

How the Chirurgian ought to prepare himſelf and his patient to the drawing out of the childe from the womb.

How theinfant that is dead in the womb muſt bee turned, bound and drawn out.

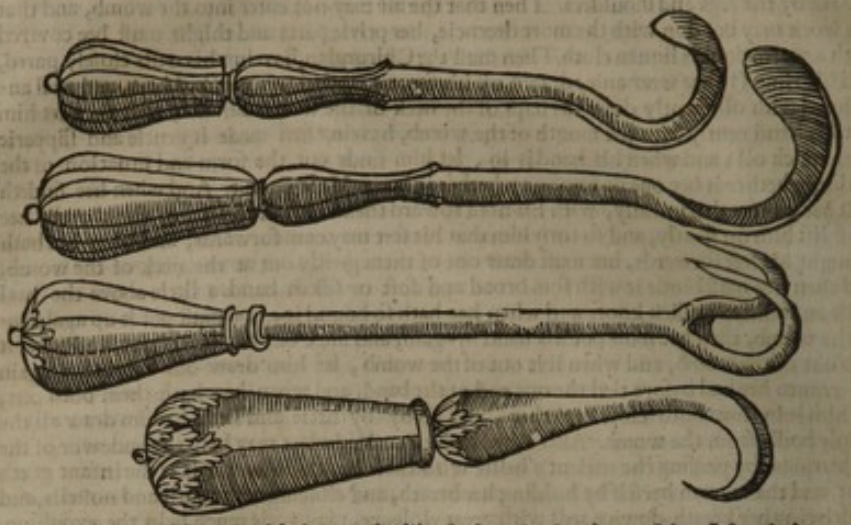
A caution to avoid ſtrangling of the infant in drawing out the bodie.

Why the childe muſt not bee drawn out with his hands forwards. An hiſtorie.

To diminiſh the winde wherewith the infant beeing dead in the womb, ſwelleth and is puffed up that hee cannot bee gotten out of the womb.

and decreaſeth, let him draw the infant out by little and little; but not raſhly, leſt hee ſhould break that whereon hee hath taken hold: the figure of thoſe hooks is thus.

The form of Hooks for drawing out the infant that is dead in the womb.

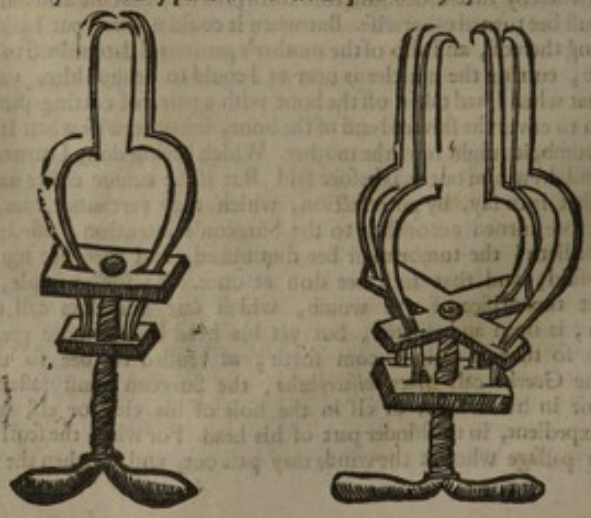


But if the breaſt bee troubled with the like fault, the hooks muſt bee faſtned about the chanel-bone: if there bee a Dropſie or a Tympanie in the bellie, the hooks muſt bee faſtned either in the ſhort ribs, that is to ſay, in the muſcles that are between the ribs, or eſpecially, if the diſeaſ do alſo deſcend into the feet, about the bones that are above the groin; or elſ putting the crooked kniſe here pictured into the womb with his left hand, let him make inciſion in the childe's bellie, and ſo get out all his entrals by the inciſion: for when hee is ſo bowelled, all the water that cauſſed the Dropſie will out. But the Surgeon muſt do none of all theſe things but when the childe is dead, and the woman that travelleth in ſuch danger that ſhee cannot handſomly bee holpen.

How the head of the infant, if it remain in the womb ſeparated from the bodie, may bee drawn out.

But if by any means it happeneth, that all the infant's members bee cut away by little and little, and that the head onely remaineth behinde in the womb, which I have ſomtimes againſt my will, and with great ſorrow ſeen; then the left hand, beeing annointed with oil of Lillies, or freſh Butter, muſt bee put into the womb, wherewith the Surgeon muſt finde out the mouth, putting his finger into it; then with his right hand hee muſt put up the hook (according to the direction of the left hand) gently, and by little and little, and ſo faſten it in the mouth, eie, or under the chin; and when hee hath firmly fixed or faſtened it, hee muſt therewith draw out the head by little and little, for fear of looſning or breaking the part whereon hee hath hold. In ſtead of this Hook, you may uſe the Inſtruments that are here deſcribed, which therefore I have taken out of the Surgerie of *Francis Dalechamps*; for they are ſo made, that they may eaſily take hold of a ſpherical and round bodie with the branches, as with fingers.

Gryphon's Talons, *that is to ſay, Inſtruments made to draw out the head of a dead infant that is ſeparated in the womb from the reſt of the bodie.*



But

But it is not verie easie to take hold on the head when it remaineth alone in the womb, by reason of the roundnes thereof, for it will slip and slide up and down, unles the bellie be pressed down, and on both sides, thereby to hold it unto the instrument, that it may with more facilitie take hold thereon. Why the head beeing alone in the womb, is more difficult to bee out.

CHAP. XXVII.

What must bee don unto the woman in travail presently after her deliverance.

THere is nothing so great an enemie to a woman in travail, especially to her whose childe is drawn away by violence, as cold: wherefore with all care and diligence shee must bee kept and defended from cold. For after the birth, her bodie beeing void and emptie, doth easily receiv the air that will enter into everie thing that is emptie, and hence shee waxeth cold, her womb is distended and puffed up, and the orifices of the vessels thereof are shut and closed, whereof commeth suppression of the after-birth, or other after-purgations. And thereof commeth manie grievous accidents, as hysterical suffocation, painful fretting of the guts, fevers, and other mortall diseases. Cold an enemie to women in travail. What accidents follow the taking of cold in a woman that is delivered of childe.

What woman soever will avoid that discommoditie, let her hold her legs or thighs across, for in so doing, those parts that were separated will bee joined and close together again. Let her bellie bee also bound or rowled with a ligature of an indifferent bredth and length, which may keep the cold air from the womb, and also press the blood out that is contained in all the substance thereof. Then give her som Capon-broth or Caudle, with Saffron, or with the powder called *Pulvis ducis*, or elf bread toasted and dipped in wine wherein spice is brewed, for to restore her strength, and to keep away the fretting of the guts. When the secundine is drawn out, and is yet hot from the womb, it must bee laid warm unto the region of the womb, especially in the Winter, but in the Summer, the hot skin of a weather newlie killed must bee laid unto the whole bellie, and unto the region of the loins. But then the curtains of the bed must bee kept dawn, and all the windows and doors of the chamber must bee kept shut with all diligence, that no cold air may com unto the woman that travaileth, but that shee may lie and take her rest quietly. The Weather's skin must be taken away after that it hath lien five or six hours, and then all the region of her bellie must bee annointed with the ointment following. Secundines must bee laid to the region of the womb whil'st they bee warm.

℞. *spermatis Ceti*, ℥ii. *olei amygdal. dulcium & hypericon. an.* ℥iß. *sevi hircini*, ℥i. *olei myrtillor.* ℥i *ceræ novæ quantum sufficit*; make thereof an ointment, wherewith let her bee annointed twice in the daie: let a plaster of *Galbanum* bee applied to the navel, in the mid'st whereof put som few grains of Civet or Musk, so that the smel of the plaster may not strike up into her nostrils. Then let this medicine following bee applied, commonly called *Tela Gualterin*. ℞. *ceræ novæ*, ℥iv. *spermatis Ceti*, ℥iß. *terebinth. venetæ in aquâ rosaceâ lotæ*, ℥ii. *olei amygdal. dulcium & hypericonis an.* ℥i. *olei mastich. & myrtini, an.* ℥ß. *axungiæ cervi*, ℥iß. melt them altogether, and when they are melted, take it from the fire, and then dip a linnen cloth therein, as big as may serv to fit the region of the bellie, whereunto it is to bee applied. These remedies will keep the external region of the bellie from wrinkling. Uuguents for the woman in travail that the region of the bellie may not bee wrinkled. The medicine called *Tela Gualterina*.

But of all other, the medicine following excelleth. ℞. *limacum rub.* lbi. *florum antbos quart.* iiii. let them bee cut all in small peeces, and put into an earthen pot well nealed with lead, and close stopped, then let it bee set in the dung of horses for the space of fortie daies, and then bee pressed or strained, and let the liquor that is strained out bee kept in a glass well covered, and set in the Sun for the space of three or four daies, and therewith annoint the bellie of the woman that lieth in childe-bed. If shee bee greatly tormented with throws, let the powder following bee given unto her. ℞. *anisi conditi* ℥ii. *nucis moschat. cornu cervi ust. an.* ℥i. ß. *nucleorum dactyllor.* ℥iii. *ligni aloës & cinnamomi, an* ℥ii. make thereof a most subtil powder, let her take ℥i. thereof at once with white wine warm. Or, ℞. *rad. consolidæ major.* ℥iß. *nucleorum persicorum, nucis moschat. an.* ℈ii. *carab.* ℈ß. *ambræ græca gra.* iv. make thereof a powder, let her take one dram thereof at a time with white wine, or if shee have a fever, with the broth of a Capon. Let there bee hot bags applied to the genitals, bellie and reins; these bags must bee made of millet and oats fried in a frying-pan with a little white wine. A powder for the fretting of the guts.

But if through the violence of the extraction the genital parts bee torn, as antient writers affirm it hath com to pass, so that the two holes, as the two holes of the privie-parts and of the fundament have been torn into one, then that which is rent must bee stitched up, and the wound cured according to art. Which is a most unfortunate chance for the mother afterwards, for when shee shall travail again, shee cannot have her genital parts to extend and draw themselvs in again by reason of the scar. So that then it will bee needful that the Chirurgian shall again open the place that was cicatrized, for otherwise shee shall never bee delivered, although shee strive and contend never so much. I have don the like cure in two women that dwelt in Paris. What must bee don when the groin is torn in childe-birth

CHAP.

CHAP. XXVIII.

What cure muſt bee uſed to the Dugs and Teats of thoſe that are brought to bed.

To drive the milk downward.

IF great ſtore and abundance of milk bee in the breaſt, and the woman be not willing to nurſher own childe, they muſt bee annointed with the unguent following, to repel the milk, and cauſit to bee expelled through the womb. R. *olei roſ. myrtini an.* ℥iii. *aceti roſat.* ℥i. incorporate them together, and therewith annointing beſprinkle them with the powder of Myrtils, and then applie the plaſter following. R. *pulv. maſtichini nucis moſchat. an.* ʒii. *nucis cupreſſi* ʒiii. *balauſt myrtil. an.* ʒiſ. *Ireos, florent.* ℥ſ. *olei myrtini* ℥iii. *terebinth. venetæ* ℥ii. *cerænovæ quantum ſufficit*, make thereof a ſoft plaſter.

The leavs of brook-lime, creſſes and box boiled together in urine and vineger, are thought a preſent remedie for this purpoſe, that is to ſay, to draw the milk from the breaſts. And others take the clay that falleth down into the bottom of the trough wherein the grindeſtone, whereon ſwords are grownd, turneth, and mix it with oil of roſes, and applie it warm unto the dugs, which in ſhort ſpace, as it is thought, will aſſwage the pain, ſtay the inflammation, and drive the milk out of the dugs. The decoction of ground-Ivie, Peruwinkle, *Sage*, red Roſes, and roach Alum beeing prepared in oxycrate, and uſed in the form of a fomentation, is thought to perform the like effect: the like virtue have the lees of red wine, applied to the dugs with vineger, or the diſtilled water of unripe Pine-apples applied to the breaſts with linnen cloaths wet therein, or hemlock beaten and applied with the young and tender leavs of a gourd.

By what reaſon, and which way cupping-glaſſes beeing faſt'ned on the groin or above the navel, do draw milk out the of breaſts.

This medicine following is approoved by uſe: Take the leavs of *Sage*, Smallage, *Rue*, and Chervil, and cut or chop them verie ſmall, and incorporate them in vineger and oil of Roſes, and ſo applie it warm to the breaſt, and renue it thrice a day. In the mean time let Cupping-glaſſes bee applied to the inner ſide of the thigh and groin, and alſo above the navel. For this is verie effectual to draw the milk out of the breaſts into the womb by the veins whereby the womb communicateth with the breaſts. Moreover, they may let children or little whelps ſuck their breaſts, whereby they may draw out the milk that is fixed faſt in their dugs, in ſteed whereof wee have invented this inſtrument of glaſs, wherewith, when the broader orifice is faſt'ned or placed on the breaſt or dug, and the pipe turned upwards towards her mouth, ſhee may ſuck her own breaſts her ſelf.

The form of a little glaſs, which beeing put on the nipple, the woman may ſuck her own breaſts.

Inſtead of this inſtrument, a viol of glaſs beeing firſt made warm, and the mouth thereof applied to the nipple or teat, by reaſon of the heat and wideneſs thereof will draw the milk forth into the bottom thereof, as it were by a certain ſucking. The after-purgations beeing firſt evacuated, which is don for the moſt part within twentie daies after the birth, if the woman bee not in danger of a fever, nor have anie other accident, let her enter into a bath, made of marjerom, mint, *ſage*, roſemarie, mugwurt, agrimonie, penniroyal, the flowrs of camomil, melilote, dill, beeing boiled in moſt pure and clear running water. All the day following let another ſuch like bath bee prepared, whereunto let theſe things following bee added. R. *farini fabarum & aven. an.* ℔.iii. *farin. orobi, lupinor. & gland. an.* ℔i. *aluminis roch.* ℥iv. *ſalis com.* ℔ii. *gallarum, nucum cupreſſi, an.* ʒiii. *roſar. rub.* m.vi. *caryophyl. nucum moſchat. an.* ʒiii. boil them all in common water, then ſew them all in a clean linnen cloth, as it were in a bag, and caſt them therein into the bath wherein Iron red hot hath been extinguiſhed, and let the woman that hath lately travailed ſit down therein ſo long as ſhee pleaſeth, and when ſhee commeth out let her bee laid warm in bed, and let her take ſom *preſerved* Orange-pill, or bread toaſted and dipped in Hippocras, or in wine brewed with ſpices, and then let her ſweat, if the ſweat will com forth of its own accord.

Aſtringent fomentations for the privie parts.

On the next day let aſtringent fomentations bee applied to the genitals on this wiſe prepared. R. *gallar. nucum cupreſſi, corticum granat. an.* ʒi *roſar. rub.* m i. *thymi, majoran. an.* m.ſ. *aluminis rochæ, ſalis com. an.* ʒii. boil them all together in red wine, and make thereof a decoction for a fomentation, for the fore-named uſe. The diſtilled liquor following is verie

excellent

excellent and effectual to confirm and to draw in the dugs, or anie other loos parts. R. *caryophyl. nucis moscbat. nucum cupressi an.* ʒiß. *mastich.* ʒii. *alumin. roch.* ʒiß. *glandium & corticis querni, an.* ℔ß. *rosar. rubr* m.i. *cort. granat.* ʒii. *terræ sigillat.* ʒi. *cornu cervi ustiʒ*ß. *myrtillor. sanguinis dracon. an.* ʒi. *boli armini.* ʒii. *ireos florent.* ʒi. *sumach. berber. Hippuris, an.* m.ß. *conquassentur omnia, & macerentur spatio duorum dierum, in* ℔ß *aquæ rosarum* ℔ii. *prunorum syvestr. mespilorum, pomorum quernorum, &* ℔ß. *aquæ fabrorum, aceti denique fortiss.* ʒiv. afterward distil it over a gentle fire, and keep the distilled liquor for your use, wherewith let the parts bee fomented twice in a day. And after the fomentation, let wollen cloaths or stupes of linnen cloth bee dipped in the liquor, and then pressed out out and laid to the place. When all these things are don and past, the woman may again keep companie with her husband.

A distilled liquor for to draw together the dugs that are loos and slack.

CHAP. XXIX.

What the causses of difficult and painful travail in childe-birth are.

THe fault dependeth somtimes on the mother, and somtimes on the infant or childe within the womb. On the mother, if shee bee more fat, if shee bee given to gormandize or great eating, if shee bee too lean or young, as *Savanarola* thinketh her to bee, that is great with childe at nine years of age, or unexpert, or more old, or weaker then shee should bee either by nature or by som accident: as by diseases that shee hath had a little before the time of childe-birth, or with a great flux of blood. But those that fall in travail before the ful and prefixed time, are verie difficult to deliver, becaus the fruit is yet unripe, and not readie or easie to bee delivered. If the neck or orifice of the womb bee narrow, either from the first conformation, or afterwards by som chance as by an ulcer cicatrized: or more hard and callous, by reason that it hath been torn before at the birth of som other childe, and so cicatrized again, so that if the cicatrized place bee not cut even in the moment of the deliverance, both the childe and the mother will bee in danger of death; also the rude handling of the midwife may hinder the free deliverance of the childe. Oftentimes women are letted in travail by shamefac'tnes, by reason of the presence of som man, or hate to som woman there present.

The causses of the difficult childe-birth that are in the woman that travaileth.

The passions of the minde hinder the birth.

If the secundine bee pulled away sooner then it is necessarie, it may caus a great flux of blood to fill the womb, so that then it cannot perform his exclusive facultie, no otherwise then the bladder when it is distended by reason of over-abundance of water that is therein, cannot cast it forth, so that there is a stoppage of the urine. But the womb is much rather hindred, or the facultie of childe-birth is stopped or delaied, if together with the stopping of the secundine, there bee either a Mole or som other bodie contrarie to nature in the womb. In the secundines of two women whom I delivered of two children that were dead in their bodies, I found a great quantitie of sand like unto that which is found about the the banks of rivers, so that the gravel or sand that was in each secundine was a full pound in weight.

Also the infant may bee the occasion of difficult childe-birth, as, if too big, if it com overthwart, if it com with its face upwards, and its buttocks forwards, if it com with its feet and hands both forwards at once, if it bee dead and swoun by reason of corruption, if it bee monstrous, if it have two bodies or two heads, if it bee manifold or seven-fold, as *Albucrasis* affirmeth he hath seen, if there bee a mole annexed thereto, if it bee verie weak, if when the waters are flowed out, it doth not moov or stir, or offer its self to com forth. Yet notwithstanding, it happeneth somtimes that the fault is neither in the mother nor the childe, but in the air, which beeing cold, doth so binde, congeal and make stiff the genital parts, that they cannot bee relaxed: or, beeing contrariwise too hot, it weakeneth the woman that is in travail, by reason that it wasteth the spirits, wherein all the strength consisteth: or in the ignorant or unexpert midwife, who cannot artificially rule and govern the endeavors of the woman in travail.

The causses of difficult childbirth that are in the infant.

The external causses of difficult childebirth.

The birth is wont to bee easie, if it bee in the due and prefixed natural time, if the childe offer himself lustily to com forth with his head forwards, presently after the waters are com forth, and the mother in like manner lustie and strong: those which are wont to bee troubled with verie difficult childe-birth, ought a little before the time of the birth, to go into an half-tub filled with the decoction of mollifying roots and seeds, to have their genitals, womb and neck thereof to bee annointed, with much oil, and the intestines that are full and loaded must bee unburthened of the excrements, and then the expulsive facultie provoked with a sharp glyster, that the tumors and swelling of the birth concurring therewith, the more easie exclusion may bee made. But I like it rather better, that the woman in travail should bee placed in a chair that hath the back thereof lean ing backwards, then in her bed, but the chair must have a hole in the bottom, whereby the bones that must bee dilated in the birth, may have more freedom to close themselvs again.

Which is an easie birth.

What causseth easinesse of child-birth.

CHAP. XXX.

The cauſe of Abortion or untimely birth.

What Abortion is.

ABortion or untimely birth is one thing, and effluxion another. They call abortion the ſudden excluſion of the childe alreadie formed and alive, before the perfect maturitie thereof. But that is called effluxion, which is the falling down of ſeeds mixed together and coagulated but for the ſpace of a few daies, onely in the forms of membranes or tunicles, congealed blood, and of an unſhapen or deformed piece of fleſh; the Midwives of our countrie call it a falſ branch or bud. This effluxion is the cauſe of great pain and moſt bitter and cruel torment to the woman: leaving behinde it weakneſs of bodie far greater then if the childe were born at the due time. The cauſes of abortion or untimely birth, whereof the childe is called an abortive, are manie, as a great ſcouring, a ſtrangurie joined with heat and inflammation, ſharp fretting of the guts, a great and continual cough, exceeding vomiting, vehement labor in running, leaping, and dauncing, and by a great fall from on high, carrying of a great burthen, riding on a trotting-horſ, or in a Coach, by vehement, often and ardent copulation with men, or by a great blow or ſtroke on the bellie. For all theſe and ſuch like vehement and inordinate motions diſſolv the ligaments of the womb, and ſo cauſ abortion or untimely birth.

What Effluxion it.

Women are in more pain by reaſon of the effluxion then at the true birth.

The cauſes of Abortion.

Alſo whatſoever preſſeth or girdeth in the mothers bellie, and therewith alſo the womb that is within it, as are thoſe Ivorie or Whale-bone buſkes, which women wear on their bodies, thereby to keep down their bellies: by theſe and ſuch like things the childe is letted or hindred from growing to his full ſtrength, ſo that by expreſſion, or as it were by compulſion, hee is often forced to com forth before the legitimate and lawful time. Thundering, the noiſ of the ſhooting of great Ordnance, the ſound, and vehement noiſ of the ringing of Bells conſtrain women to fall in travell before their time, eſpecially women that are young, whoſe bodies are ſoft, ſlack and tenderer then thoſe that bee of riper years. Long and great faſting, a great flux of blood, eſpecially when the infant is grown ſomwhat great: but if it bee but two moneths old, the danger is not ſo great, becauſ then hee needeth not ſo great quantitie of nouriſhment, alſo a long diſeaſ of the mother, which conſumeth the blood, cauſeth the childe to com forth being deſtitute of ſtore of nouriſhment before the fit time. Moreover, fulneſs, by reaſon of the eating great ſtore of meats, often maketh or cauſeth untimely birth; becauſ it depraveth the ſtrength, and preſſeth down the childe: as likewiſe the uſe of meats that are of an evil juice, which they luſt or long for. But bath's, becauſ they relax the ligaments of the womb, and hot houſes, for that the fervent and choaking air is received into the bodie, provoke the infant to ſtrive to go forth to take the cold air, and ſo cauſ abortion.

Girding of the bellie may cauſ untimely birth.

How bathes and hot houſes cauſ untimely birth.

What women ſoever, being indifferently well in their bodies, travail in the ſecond or third moneth without anie manifeſt cauſ, thoſe have the Cotylidones of their womb full of filth and matter, and cannot hold up the infant, by reaſon of the weight thereof, but are broken: Moreover, ſudden or continual perturbations of the minde, whether they bee through anger or fear, may cauſ women to travail before their time, and are accounted as the cauſes of abortions, for that they cauſ great and vehement trouble in the bodie. Thoſe women that are like to travail before their time, their dugs will wax little: therefore when a woman is great with childe, if her dugs ſuddenly wax ſmall or ſlender, it is a ſign that ſhe will travail before her time; the cauſ of ſuch ſhrinking of the dugs is, that the matter of the milk is drawn back into the womb, by reaſon that the infant wanteth nouriſhment to nouriſh & ſuccour it withall. Which ſcarcitie the infant not long abiding, ſtriveth to go forth to ſeek that abroad which hee cannot have within, for among the cauſes which do make the infant to com out of the womb, thoſe are moſt uſually named with *Hippocrates*, the neceſſitie of a more large nutriment and air.

Hip. aph. 53. & 37 ſect 5.

Hip. aph. 45. ſect. 5.

Hip. aph. 38. ſect. 5.

Therefore if a woman that is with childe have one of her dugs ſmall, if ſhee have two children, ſhee is like to travail of one of them before the full and perfect time: ſo that if the right dug bee ſmall, it is a man-childe, but if it bee the left dug it is a female. Women are in far more pain when they bring forth their children before the time, then if it were at the full and due time; becauſ that whatſoever is contrarie to nature, is troubleſom, painfull, and alſo oftentimes dangerous. If there bee anie error committed at the firſt time of the childe-birth, it is commonly ſeen that it happeneth alwaies after at each time of childe-birth. Therefore, to finde out the cauſes of that error, you muſt take the counſel of ſom Phyſician, and after his counſel indeavour to amend the ſame. Truly this plaſter following beeing applied to the reines doth confirm the womb, and ſtay the infant therein. R. *ladani* ʒii. *galang.* ʒi. *nucis moſchat nucis cupreſſi, boli armeni, terræ ſigil. ſanguin. draconis, balauſt. an.* ʒß, *acatiæ, pſidiorum, bipociſtid. an.* ʒi. *maſtich. myrrhæ, an.* ʒ ii. *gummi arabic.* ʒ i. *terebinthvenet.* ʒii *picis naval.* ʒi. ß. *ceræ quantum ſufficit, fiat emplaſt. ſecundum artem:* ſpread it for your uſe upon leather. If the part begin to itch, let the plaſter bee taken awaie, & inſtead thereof uſe *unguent. roſat.* or *refrig. Galen.* or this that followeth. R. *olei myrtini. maſtich. cydonior. an.* ʒ i. *hypo. boli armen. ſang. draconis acatiæ, an.* ʒ i. *ſant. citrini.* ʒß. *ceræ quant. ſuf.* make thereof an ointment according unto art. There are women that bear the childe

Women are in more pain at the untimely birth then at the due time of birth.

The error of the firſt childbirth continues afterwards.

A plaſter ſtaying the infant in the womb.

childe in their womb ten or eleven whole moneths, and ſuch children have their conformation of much quantitie of ſeed: wherefore they will bee more big, great and ſtrong, and therefore they require more time to com to their perfection and maturitie; for thoſe fruits that are great will not bee ſo ſoon ripe as thoſe that are ſmall. But children that are ſmall and little of bodie do often com to their perfection and maturitie in ſeven or nine moneths: if all other things are correſpondent in greatneſs and bigneſs of bodie, it happeneth for the moſt part that the woman with childe is not delivered before the ninth moneth bee don, or at the leaſtwiſe in the ſame moneth. But a male childe will bee commonly born at the beginning, or a little before the beginning of the ſame moneth, by reaſon of his engraffted heat which cauſſeth maturitie and ripeneſs. Furthermore, the infant is ſooner com to maturitie and perfection in a hot woman then in a cold, for it is the propertie of heat to ripen.

What children are ten or eleven moneths in the womb.

A male will bee born ſooner then a female.

CHAP. XXXI.

How to preſerv the infant in the womb, when the mother is dead.

IF all the ſigns of death appear in the woman that lieth in travel, and cannot bee delivered, there muſt then bee a Surgeon readie and at hand, which may open her bodie ſo ſoon as ſhee is dead, whereby the infant may bee preſerved in ſafetie; neither can it bee ſuppoſed ſufficient if the mother's mouth and privie parts bee held open; for the infant being encloſed in his mother's womb, and compaſſed with the membranes, cannot take his breath, but by the contractions and dilatations of the arterie of the navel. But when the mother is dead, the lungs do not execute their office and function: therefore they cannot gather in the air that compaſſeth the bodie by the mouth or *aſpera arteria* into their own ſubſtance, or into the arteries that are diſperſed throughout the bodie thereof, by reaſon whereof it cannot ſend it unto the heart by the veinie arterie which is called *arteria venalis*: for if the heart want air, there cannot bee anie in the great arterie which is called *arteria aorta*, whoſe function it is to draw it from the heart; as alſo by reaſon thereof it is wanting in the arteries of the womb, which are as it were the little conduits of the great arterie, whereinto the air that is brought from the heart is derived, and floweth in unto theſe little ones of all the bodie, and likewiſe of the womb. Wherefore it muſt of neceſſitie follow that the air is wanting to the cotyledons of the ſecundines, to the arterie of the infants navel, the iliack arteries alſo, and therefore unto his heart, and ſo unto his bodie: for the air being drawn by the the mother's lungs, is accuſtomed to com to the infant by this continuation of paſſages. Therefore becauſ death maketh all the motions of the mother's bodie to ceaſ, it is far better to open her bodie ſo ſoon as ſhee is dead, beginning the inciſion at the cartelage, *Xiphoides*, or breaſt-blade, and makeing it in a form ſemicircular, cutting the skin, muſcles and *peritonæum*, not touching the guts: then the womb being lifted up, muſt firſt bee cut, leſt that otherwiſe the infant might perchance bee touched or hurt with the knife.

Why it is not ſufficient to preſerv life in the childe to hold open the mouth and privie parts of the mother ſo ſoon as ſhee is dead and the childe alive in her bodie.

How the bellie of the woman that dieth in travel muſt bee cut open to ſave the childe.

You ſhall oftentimes finde the child unmoveable, as though hee were dead; but not becauſ hee is dead indeed, but by reaſon that hee, beeing deſtitute of the acceſſe of the ſpirits by the death of the mother, hath contracted a great weakneſs: yet you may know whether hee bee dead indeed or not, by handling the arterie of the navel, for it will beat and pant if hee bee alive, otherwiſe not; but if there bee anie life yet remaining in him, ſhortly after hee hath taken in the air, and is recreated with the acceſs thereof, hee will move all his members, and alſo all his whole bodie. In ſo great a weakneſs or debilitie of the ſtrength of the childe, by cutting the navel ſtring, but it muſt rather bee laid cloſe to the region of the belie thereof, that thereby the heat (if there bee anie jot remaining) may bee ſtirred up again. But I cannot ſufficiently marvail at the inſolencie of thoſe that affirm that they have ſeen women whoſe bellies and womb have been more then once cut, and the infant taken out, when it could no otherwiſe bee gotten forth, aud yet notwithſtanding alive; which thing there is no man can perſwade mee can bee done, without the death of the mother, by reaſon of the neceſſarie greatneſs of the wound that muſt bee made in the muſcles of the belie, and ſubſtance of the womb, for the womb of a woman that is great with child, by reaſon that it ſwelleth, and is diſtended with much bloud, muſt needs yield a great flux of bloud, which of neceſſitie muſt bee mortal. And to conclude, when that the wound or inciſion of the womb is cicatrized, it will not permit or ſuffer the womb to bee dilated or extended to receiv or bear a new birth. For theſe and ſuch like other cauſſes, this kinde of cure, as deſperate and dangerous, is not (in mine opinion) to be uſed.

How it may bee known whether the infant bee alive or not.

CHAP. XXXII.

Of superfetation.

What superfetation is.

SUperfetation is when a woman doth bear two or more children at one time in her womb, and they bee encloſed each in his ſeveral ſecundine: but thoſe that are included in the ſame ſecundine, are ſuppoſed to bee conceived at one and the ſame time of copulation, by reaſon of the great and copious abundance of ſeed, and theſe have no number of daies between their conception and birth, but all at once. For as preſently after meat the ſtomach which is naturally of a good temper, is contracted or drawn together about the meat, to comprehend it on everie ſide, though ſmall in quantitie, as it were by both hands, ſo that it cannot rowl neither unto this or that ſide; ſo the womb is drawn together unto the conception about both the ſeeds, aſſoon as they are brought into the capacitie thereof, and is ſo drawn in unto it on everie ſide, that it may com together into one bodie, not permitting anie portion thereof to go into anie other region or ſide, ſo that by one time of copulation the ſeed that is mixed together, cannot engender more children then one, which are divided by their ſecundines. And moreover, becauſ there are no ſuch cells in the wombs of women, as are ſuppoſed, or rather known to bee in the wombs of beaſts, which therefore bring forth manie at one conception or birth. But now if anie part of the woman's womb doth not applie and adjoin it ſelf cloſely to the conception of the ſeed already received, leſt anie thing ſhould bee given by nature for no purpoſe, it muſt of neceſſitie follow that it muſt bee filled with air, which will alter and corrupt the ſeeds. Therefore the generation of more then one infant at a time, haveing everie one his ſeveral ſecundine, is on this wiſe. If a woman conceiv by copulation with a man as this day, and if that for a few daies after the conception, the orifice of the womb bee not exactly ſhut, but rather gape a little, and if ſhee do then uſe copulation again, ſo that at both theſe times of copulation there may bee an effuſion or perfect mixture of the fertile ſeed in the womb, there will follow a new conception, or ſuperfetation. For ſuperfetation is no other then a certain ſecond conception, when the woman already with childe, again uſeth copulation with a man, and ſo conceiveth again, according to the judgment of *Hippocrates*. But there may bee manie cauſſes alledged why the womb which did join and cloſe doth open and unlooſ it ſelf again. For there bee ſom that ſuppoſe the womb to bee open at certain times after the conception, that there may bee an iſſue out for certain excremental matters that are contained therein, and therefore that the woman that hath ſo conceived alreadie, and ſhall then uſe copulation with a man again, ſhall alſo conceiv again.

A woman's womb is not diſtinguiſhed into diverſ cels.

The reaſon of ſuperfetation.

Lib. de ſuperfœtationibus.

Why the womb after the conception of the ſeed, doth many times afterwards open.

Others ſay that the womb of it ſelf, and of its own nature is verie deſirous of ſeed or copulation, or elſ beeing heated or enflamed with the pleaſant motion of the man mooving her thereto, doth at length uncloſe it ſelf to receiv the man's ſeed: for likewiſe it happeneth manie times that the orifice of the ſtomach beeing ſhut after eating, is preſently unlooſed again, when other delicate meats are offered to bee eaten: even ſo may the womb uncloſe it ſelf again at certain ſeaſons, whereof com manifold iſſues, whoſe time of birth and alſo of conception are different. For as *Plinie* writeth, when there hath been a little ſpace between two conceptions, they are both haſtened, as it appeared in *Hercules* and his brother *Iphicles*; and in her which haveing two children at a birth, brought forth one like unto her husband, and another like unto the adulterer. And alſo in the Procomeſian ſlave or bond-woman, who, by copulation on the ſame day, brought forth one like unto her maſter, and another like unto his ſteward: and in another who brought forth one at the due time of childe-birth, and another at five months end. And again in another, who bringing forth her burthen on the ſeventh month, brought forth two more in the months following. But this is a moſt manifeſt argument of ſuperfetation, that as manie children as are in the womb (unleſs they bee twins of the ſame ſex) ſo manie ſecundines are there, as I have often ſeen my ſelf. And it is verie likely that if they were conceived in the ſame moment of time, that they ſhould all bee included in one ſecundine. But when a woman hath more children then two at one burden, it ſeemeth to bee a monſtrous thing, becauſ that nature hath given her but two breaſts. Although wee ſhall hereafter rehearſ manie examples of more numerous births.

Lib.7. cap.11.

CHAP. XXXIII.

Of the tumor called Mola, *or a Mole growing in the womb of Women.*

The reaſon of the name.

OF the Greek word *Myle*, which ſignifieth a Mill-ſtone, this tumor called *Mola* hath its name: for it is like unto a Mill-ſtone both in the round or circular figure, and alſo in hard conſiſtence, for the which ſelf ſame reaſon the whirl-bone of the knee is called of the Latines *Mola*, and of the Greeks *Myle*. But the tumor called *Mola*, whereof wee here entreat, is nothing elſ but a certain falſ conception of deformed fleſh, round and hard, conceived in the womb as it were rude and unperfect,

What a *Mola* is.

and

not distinguished into members, comming by corrupt, weak, and diseased seed, and of the immoderate flux of the termes, as it is defined by *Hippocrates*. This is inclosed in no secundine, but as it were in its own skin. *Lib. de steril.*

There are som that think the *Mola* to bee ingendered of the concourse or mixture of the womans seed and menstrual blood, without the communication of the mans seed. But the opinion of *Galen* is, that never anie man saw a woman conceiv either a *Mola*, or anie other such thing, without copulation of man, as a hen laieth eggs without a cock: for the onely caus and original of that motion is in the mans seed, and the mans seed doth onely minister matter for the generation thereof. Of the same opinion is *Avicen*, who thinketh the *Mola* to bee made by the confluxion of the mans seed that is unfertile, with the womans; when as it, becaus unfruitful, onely puff's up or make's the womans seed to swell as leaven into a greater bigness, but not into anie perfect shape or form. Which is also of the opinion of *Fernelius*, by the decrees of *Hippocrates* and *Avicen*: for the immoderate fluxes of the courses are conducing to the generation of the *Mola*, which overwhelming the mans seed, being now unfruitful and weak, doth constrain it to desist from its interprise of conformation alreadie begun, as vanquished or wholly overcom: for the generation of the *Mola* commeth not of a simple heat working upon a clammie and gross humor, as worms are generated; but of both the seeds, by the efficacie of a certain spirit, after a sort prolifical, as may bee understood by the membranes wherein the *Mola* is inclosed, by the ligaments whereby manie times it is fastened or bound to the true conception or childe, engendered or begotten by superfœtation; and finally, by the increas, and great and sluggish weight. If all men were not perswaded that the conflux of a mans seed must of necessitie concur to the generation of the *Mola*, it would bee no small cloak or cover to women to avoid the shame and reproach of their light behavior. *Cap. 7. lib. 4. de usu part.*

How the *mola* is engendered.

CHAP. XXXIV.

How to discern a true conception from a false conception or Mola.

The signes of a *mola* inclosed in the womb.

When the *Mola* is inclosed in the womb, the same things appear as in the true and lawful conception. But the more proper signes of the *Mola* are these: there is a certain pricking pain, which at the beginning troubleth the bellie as if it were the cholick, the belly will swel sooner then it would if it were the true issue, and will bee distended with greater hardness, and is more difficult and troublesom to carrie, becaus it is contrarie to nature, and void of soul or life. Presently after the conception the dugs swel and puff up, but shortly they fall and becom lank and lax; for nature sendeth milk thither in vain, becaus there is no issue in the womb that may spend the same. The *Mola* will move before the third month, although it bee obscurely, but the true conception will not: but this motion of the *Mola* is not of the intellectual soul, but of the faculties of the womb, and of the spirit of the seed dispersed through the substance of the *Mola*; for it is nourished and increaseth after the manner of plants, but not by reason of a soul or spirit sent from above, as the infant doth. Moreover, that motion that the infant hath in its due and appointed time, differeth much from the motion of the *Mola*; for the childe is mooved to the right side, to the left side, and to everie side gently, but the *Mola*, by reason of its heavines, is fixed, and rowleth in manner of a stone, carried by the weight thereof unto what side soever the woman declineth her self. The woman that hath a *Mola* in her womb doth dalie wax leaner and leaner in all her members, but especially in her leggs, although notwithstanding towards night they will swel, so that shee will bee verie slow or heavie in going, the natural heat forsakeing the parts remote from the heart by little and little: and moreover, her bellie swel's, by reason that the menstrual matter resteth about those places, and is not consumed in the nourishment of the *Mola*; shee is swoln as if shee had the dropsie, but that it is harder, and doth not rise again when it is pressed with the fingers. The navel doth not stand out as it will do when the true issue is conteined in the womb, neither do the courses flow as they somtimes do in the true conception; but somtimes great fluxes happen, which eas the weight of the bellie. In manie when the *Mola* doth cleav not verie fast, it falleth awaie within three or four moneths, beeing not as yet com unto its just bigness; and manie times it cleaveth to the sides of the womb & Cotylidons verie firmly, so that som women carrie it in their wombs five or six yeers, and som as long as they live.

By what faculties the womb mooveth.

How the motion of the *mola* differeth from the motion of the infant in the womb.

The *mola* doth turn to each side of the womb, as the situation of the bodie is.

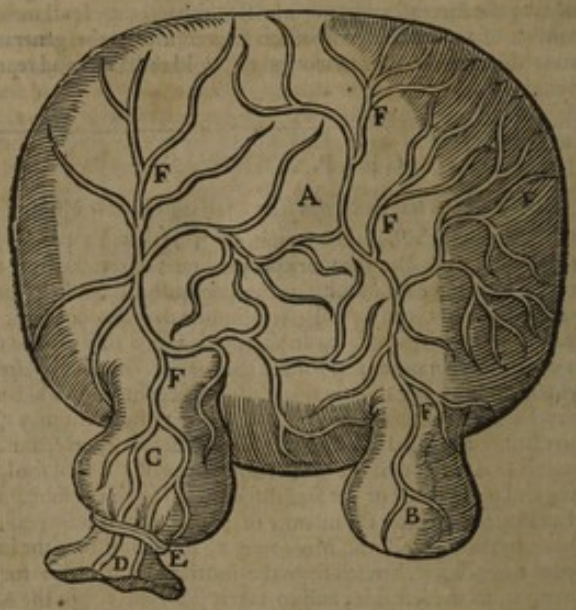
The wife of *Guiliam Roger* Pewterer, dwelling in St. *Victors* street, bore a *Mola* in her womb seventeen yeers, who beeing of the age of fiftie yeers, died; and I haveing opened her found the bodie of her womb to bee almost loosed, and not tied or bound by its accustomed ligatures, but as it were hanging onely by the neck, and furthermore cleaving to the Kall adjoining to it, haveing but onely one testicle, and that on the right side, and that somwhat broader and looser then usual: the hornes were not to bee seen except it were on that side, the vessels were on the neck onely, and there verie manifest and puffed up, it was as big as a mans head. When I had taken it out of her bodie, I brought it home unto my hous, that at my

A historie.

The deſcripti-on of a *Mola* carried ſeven-teen yeers in the womb.

my leaſure I might finde out what was conteined in it ſo long; therefore, on a certain day, calling together the chief Phyſicians of Paris, as *Maſſilæus*, *Alexis*, *Vigor*, *de S. Pont. Feure*, *Bravet*, *Violais*, *Grealmus*, *Ravin*, *Mareſcotius*, *Milotus*, *Hautin*, *Riolan*, *Luſſon*; and Surgeons, as *Brun*, *Goiterel*, *Guillemeau*; all theſe beeing preſent, I opened the womb, and I found it in all the bodie thereof, and in the proper tunicle, ſo ſchirrhous, and ſo hard, that I could hardly cut or make a knife to enter it: the bodie thereof was three fingers thick. In the midſt of the capacitie thereof I found a lump of fleſh as big as both my fiſts, like unto a Cow's udder, cleaving to the ſides of the womb but in certain placee, of a verie thick, unequal and cloddith ſubſtance, with manie bodies therein, even as are commonly found in wens and griſtles, diſperſed through it as if it were bones. The judgment of all that were preſent was, that this great tumor at the firſt was a *Mola*, which in proceſs of time degenerated into a ſchirrous bodie, together with the proper ſubſtance of the womb. Moreover, in the middle of the neck of the womb, wee found a tumor as big as a Turkie's egg, of ſubſtance hard, cartilaginous and bonie, filling all the whole neck, but eſpecially the inward orifice of the womb, which the common people of France do call the *Garland*, ſo that by that paſſage nothing could go out, or enter into the womb: all that tumor weighed nine pounds and two ounces, which I, by reaſon of the noveltie of the thing, keep in my cloſer, and here I have deſcribed it.

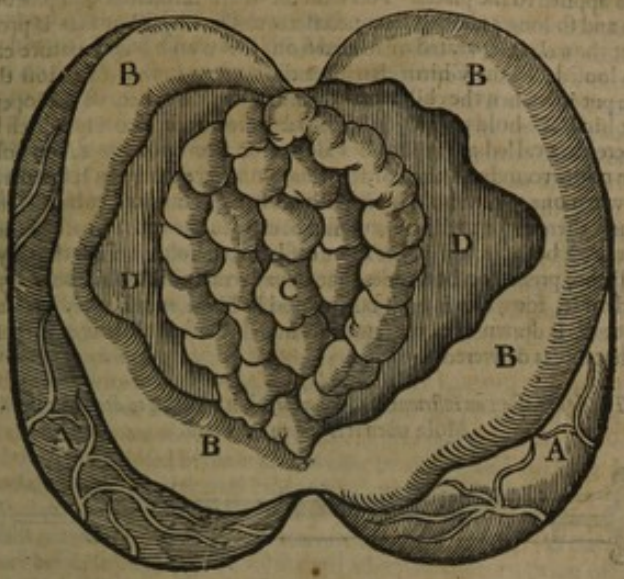
The external form and deſcription of the fore-named womb.



A. *Sheweth the bodie of the womb.*
B. *The teſticle.*
C. *The neck of the womb, wherein that little tumor was contained.*
D. *Sheweth the end of the neck of the womb that was plucked in ſunder, and alſo the veſſels whereby it drew the nutriment unto it.*
E. *Sheweth the hand.*
FFF. *The veſſels diſperſed thorow the womb.*

The

The deſcription of the womb beeing open, and ſhewing the Mola *contained therein.*



A.A. *Shew the external and ſuperficial part of the womb.* B.B.B.B. *Shew the thickneſs of the bodie, or proper ſubſtance of the womb.* C. *Sheweth the* Mola. D.D. *Shew that concavitie wherein the* Mola *was contained, or incloſed in the womb.*

As long as the woman carried this *Mola* in her womb, ſhee felt moſt ſharp pain in her bellie, the region of her bellie was marvellous hard, diſtended and large, as if it were a woman that had manie children at once in her womb; ſo that manie Phyſicians, when the time of childe-birth was paſt, ſuppoſed that ſwelling of the bellie to com of the dropſie, and aſſaied to cure it as they would the dropſie; but for all the medicines they could uſe, the bellie became never the leſſer. Oftentimes the urine was ſtopped for the ſpace of three daies, and then the makeing of urine was verie painfull unto her, and manie times alſo her excrements were ſtopped for the ſpace of a week, by reaſon that the guts were preſſed by the weight of the *Mola*. At certain ſeaſons, as everie third moneth, there came exceeding great fluxes, the matter thereof could not bee carried through the capacitie of the womb, as wee ſaid before, becauſe it was exactly ſhut and ſtopped, but through the veſſels by which virgins, and alſo certain other women great with childe evacuate their menſtrual matter. If the *Mola* bee expelled or caſt out in the firſt or ſecond moneth, as manie times it ſo happeneth, it is called of women an unprofitable or falſe conception. Somtimes there are found in one womb two or three moles ſeparated one from another, and ſomtimes bound or tied to the ſound and perfect infant. As it happened in the wife of *Valleriola* the Phyſician, which was delivered of a *Mola* which ſhee had carried in her womb twelve moneths, annexed with a childe of four moneths old, which had deprived the infant both of its room and nutriment. For it is alwaies to bee certainly ſuppoſed, that the *Mola*, as a cruel beaſt, by its ſocietie, and keeping it from its nutriment and place, kil's the infant that is joined unto it.

A vain or unprofitable conception.

The *Mola* kill's the infant in the womb, when it is faſtened unto it.

I remember once I opened the bodie of a dead woman, which had a *Mola* in her womb, as big as a Gooſ-egg, which when nature had aſſaied by manie vain endevors to caſt out, remained notwithſtanding, and at length putrefied, and therewith infected the whole womb, whereof ſhee died. There bee ſom which judging themſelvs great with childe, doe about the ninth or tenth moneth expell no other thing but ſounding blaſts of winde; whereby the womb ſuddenly falling down, and waxing more ſlender, they are ſaid in a mockerie to have been delivered of a fart. To conclude, whatſoever reſemble's beeing with childe, if it bee not excluded at the due and lawful time of childe-birth by its own accord, or by the ſtrength of nature, then muſt it bee expelled by art.

CHAP. XXXV.

What cure muſt bee uſed to the Mola.

ALl things that provoke the flowers and ſecundines, and exclude the infant, beeing dead, are to bee preſcribed, given inwardly, put up, and applied outwardly, as the trochiſces

of

Thoſe things that provoke the flowrs forcibly, do alſo conſume or waſte the *mola*.

of *myrrha*, hermodactyls, and ſuch like, firſt haveing fomentations that are relaxing and mollifying alwaies applied to the places. You muſt uſe theſe medicines and phlebotomie, diet and baths then and ſo long as it ſhall ſeem neceſſarie to the Phyſician that is preſent. But if it happen's that the *mola* is ſeparated or looſed from the womb, and nature cannot expel it when it is ſo looſed, let the Chirurgian place the woman in that ſituation that wee ſaid ſhee was to bee put in, when the childe was to bee drawn from her. Then opening her genital parts, let him take hold on it by putting an inſtrument into it, which by reaſon of the likeneſs thereof is called a Gryphon's Talon, for it cannot bee taken hold on otherwiſe, by reaſon of the roundneſs thereof, for it hath no place whereon it bee may taken hold of: therefore when one taketh hold on it with his hand, it cannot bee holden faſt by reaſon of the ſlipperineſs thereof, but will run aud ſlip back into the hollowneſs of the womb, like unto a bowl or great ball; but it may bee more eaſily taken hold on with the Gryphon's Talon, if the belly bee preſſed on both ſides that it may remain ſtill while the Gryphon's Talon take's hold on it, for when it hath taken good hold on it, it may bee eaſily drawn out. When the *mola* is drawn out, the ſame cure muſt bee uſed to the woman, as is uſed to a woman after that ſhee is delivered of childe.

The Chirurgical extraction of the *mola*.

The figure of an an inſtrument called a Gryphon's Talon, to draw out the Mola *when it is looſ in the womb.*

CHAP. XXXVI.

Of Tumors or ſwellings happening to the Pancreas *or ſweet-bread, and the whole Meſenterie.*

THe tumors of other places and parts in the bellie ought diligently to bee diſtinguiſhed from the *mola*, and other tumors of the womb. For when the tumors ariſe in the *glandula* called *Pancreas*, and in all the whole *Meſenterium*, manie unſkilful Chirurgians take them for *mola's* or ſcirrhous tumors of the womb, and ſo go erroneouſly about to cure them, as ſhall appear by theſe hiſtories following.

An hiſtorie.

Iſabel Rolant the wife of *John Bony* dwelling in Paris in the ſtreet *Moncey* near to St. *Gervaſe* his Church, beeing threeſcore years of age, departed this life in the year of our Lord 1578. on the twentie ſecond daie of October: and her bodie beeing opened in the preſence of Doctor *Milot* the Phyſician, hee, when the Meſenterie was taken out of the bodie, cauſſed it to bee carried home to his houſe, that at his leaſure hee might finde out the cauſe of this mortal diſeaſe, which was alwaies ſuſpected to bee in the Meſenterie. Therefore on a time calling *Varadeus*, *Brove*, *Chappel*, *Mareſcotius*, *Arragonius*, *Baillutius*, *Reburtius*, and *Riolan*, all Doctors of Phylick, and mee and *Pineus* Chirurgians, to his houſe to ſee the ſame. Where wee found all the Meſenterie and the *Pancreas* in the Meſenterie ſwoln and puffed up with a marvellous and almoſt incredible tumor, ſo that it weighed ten pound and a half, altogether ſcirrhous on the outſide, cleaving on the hinder part onely to the *vertebres* of the loins: but on the fore-part to the *Peritoneum*, being alſo ſcirrhous and wholly cartilaginous. Moreover, there were infinite other abſceſſes in the ſame Meſenterie, everie one cloſed in his ſeveral ciſt, ſom filled with a honie-like, ſom filled with a tallow-like, ſom with an albugineous, and ſom with a wateriſh liquor or humor, whereof ſom alſo were like unto pap; and to conclude, look how manie abſceſſes there were, ſo manie kindes or differences of matters there were. It was then eight years ſince that tumor began to grow by little and little wihout feeling and pain unto ſuch a greatneſs, becauſe that the Meſenterie it ſelf was without pain in a manner. For the woman her ſelf could do all the faculties of nature almoſt as well as if ſhee had been ſound and whole, except that two months before ſhee died, ſhee was conſtrained to keep her bed, becauſe ſhee had a continual fever, which endured ſo long as ſhee lived, and alſo becauſe that the Meſenterie, beeing as it were ſeparated or torn from its roots or ſeat, did rowl up and down in the bellie, not without the feeling of grievous pain: for, as wee ſaid before, it did ſtick but onely to the *vertebres* of the

Apoſtumes of diverſ kindes in the *Meſenterium*.

The accidents that com when the *Meſenterium* is ſeparated from the bodies adjoining.

the loins and *Peritonæum*, and nothing at all to the guts and other parts whereunto it is as it were naturally knit or joined.

Therefore becauſe the weight and heavineſs thereof depreſſed the bladder, it cauſſed a great difficultie in her making of water, and alſo becauſe it reſted on the guts, it made it verie painful for her to go to ſtool, ſo that the excrements would not com down except ſhee took a ſharp glyſter to cauſe them: and as concerning glyſters, they could not bee put up high enough by reaſon of the greatneſs of the tumor which encloſed and ſhut the way; and ſuppoſitories did no good at all. It was alſo verie difficult for her to take breath, by reaſon that the midriff or *diaphragma* was compreſſed with the tumor. There were ſom that did ſuſpect it to bee a *mola*, others thought that it came by reaſon of the dropſie. Aſſuredly this diſeaſe cauſſed the dropſie to enſue; neither was the cauſe thereof obſcure, for the function of the Liver was fruſtrated by reaſon that the concoction or the alteration of the Chylus was intercepted by occaſion of the tumor: and moreover, the Liver it ſelf had a proper diſeaſe, for it was hard and ſcirrhous, and had manie abſceſſes both within and without it, and all over it. The milt was ſcarce free from putrefaction, the guts and Kall were ſomwhat blew and ſpotted, and to bee brief, there was nothing found in the lower bellie.

The dropſie comming of a tumor of the *Meſenterium*.

There is the like hiſtorie to bee read, written by *Philip Ingraſſius*, in his book of tumors, of a certain Moor that was hanged for theft, for (ſaith hee) when his bodie was publickly diſſected, in the *Meſenterium* were found ſeventie ſcrophulous tumors, and ſo manie abſceſſes were contained or encloſed in their ſeveral ciſts or skins, and ſticking to the external tunicle, eſpecially of the greater guts: the matter contained in them was divers, for it was hard, knottie, clammie, glutinous, liquid and wateriſh,; but the entrails, eſpecially the Liver and the milt, were found free from all manner of tainture, becauſe (as the ſame Author alledgeth) nature being ſtrong, had ſent all the evil juice, and the corruption of the entrals into the Meſenterie: and verily this Moor, ſo long as he lived, was in good & perfect health. Without doubt the corruption of ſuperfluous humors for the moſt part is ſo great (as is noted by *Fernelius*) that it cannot bee received in the receptacles that nature hath appointed for it; therefore then no ſmall portion thereof falleth into the parts adjoining, and eſpecially into the Meſenterie and *Pancreas*, which are as it were the ſink of the whole bodie. In thoſe bodies which through continual and dailie gluttonie abound with choler, melancholie and phlegm, if it bee not purged in time, nature beeing ſtrong and luſtie, doth depel and drive it down into the *pancreas* and the Meſenterie, which are as places of no great repute, and that eſpecially out of the Liver and Milt by thoſe veins or branches of the *vena porta* which end or go not into the guts, but are terminated in the Meſenterie and *Pancreas*. In theſe places diverſ humors are heaped together, which in proceſs of time turn into a looſ and ſoft tumor, and then if they grow bigger, into a ſtiff, hard and verie ſcirrhous tumor. Whereof *Fernelius* affirmeth that in thoſe places hee hath found the cauſſes of choler, melancholie, fluxes, dyſenteries, cachexia's, atrophia's, conſumptions, tedious and uncertain fevers, and laſtly of manie hidden diſeaſes, by the takeing whereof ſom have received their health, that have been thought paſt cure. Moreover *Ingraſſius* affirmeth out of *Julius Pollux* that Scrophulae's may bee engendred in the Meſenterie, which nothing differ's from the minde and opinion of *Galen*, who ſaith that Scrophulae's are nothing elſ but indurate and ſcirrhous kernels. But the *Meſenterium* with his glandules beeing great and manie, makeing the *Pancreas*, doth eſtabliſh, ſtrengthen and confirm the diviſions of the veſſels. Alſo the *ſcirrhus* of the proper ſubſtance of the womb is to bee diſtinguiſhed from the *mola*: for in the bodies of ſom women that I have opened, I have found the womb annoied with a ſcirrhous tumor as big as a man's head, in the cureing whereof Phyſicians nothing prevailed, becauſe they ſuppoſed it to bee a *mola* contained in the capacitie of the womb, and not a ſcirrhous tumor in the bodie thereof.

Tom.1.tra.1. cap.1.

Lib.6.part.mor. cap.7.

The *Meſenterium* is the ſink of the bodie.

The Scrophulae's in the *Meſenterium*.

A *ſcirrhus* of the womb.

CHAP. XXXVII.

Of the cauſe of barrenneſs in men.

THere are manie cauſſes of barrenneſs in men, that is to ſay, the too hot, cold, drie or moiſt diſtemper of the ſeed, the more liquid and flexible conſiſtence thereof, ſo that it cannot ſtay in the womb, but will preſently flow out again: for ſuch is the ſeed of old men and ſtriplings, and of ſuch as uſe the act of generation too often and immoderately: for thereby the ſeed becommeth crude and wateriſh, becauſe it doth not remain his due and lawful time in the teſticles, wherein it ſhould bee perfectly wrought and concocted, but is evacuated by wanton copulation. Furthermore, that the ſeed may bee fertile, it muſt of neceſſitie bee copious in quantitie, but in qualitie well concocted, moderately thick, clammie, & puffed with abundance of ſpirits; both theſe conditions are wanting in the ſeed of them that uſe copulation too often: and moreover, becauſe the wives of thoſe men never gather a juſt quantitie of ſeed laudable both in qualitie and conſiſtence in their teſticles, whereby it commeth to paſs that they are the leſs provoked or delighted with venereous actions, and perform the act with

How the ſeed is unfertil.

with leſs alacritie, ſo that they yeeld themſelvs leſs prone to conception. Therefore let thoſe that would bee parents of manie children uſe a mediocritie in the uſe of venerie.

How the cutting of the veins behinde the ears maketh men barren.

The woman may perceiv that the man's ſeed hath ſom diſtemperature in it, if when ſhee hath received it into her womb, ſhee feeleth it ſharp, hot or cold, if the man bee more quick or ſlow in the act. Manie becom barren after they have been cut for the ſtone, and likewiſe when they have had a wound behinde the ears, whereby certain branches of the jugular veins and arteries have been cut, that are there, ſo that after thoſe veſſels have been cicatrized, there followed an interception of the ſeminal matter downwards, and alſo of the communitie which ought of neceſſitie to bee between the brain and the teſticls, ſo that when the conduits or paſſages are ſtopped, the ſtones or teſticles cannot anie more receiv, neither matter nor lively ſpirits from the brain in ſo great quantitie as it was wont, whereof it muſt of neceſſitie follow, that the ſeed muſt bee leſſer in quantitie, and weaker in qualitie.

Thoſe that have their teſticles cut off, or elſ compreſſed or contuſed by violence, cannot beget children, becauſ that either they want that help the teſticles ſhould miniſter in the act of generation, or elſ becauſ the paſſage of the ſeminal matter is intercepted or ſtopped with a Callus: by reaſon whereof they cannot yeeld forth ſeed, but a certain clammie humor contained in the glandules called *proſtatæ* (yet with ſom feeling of delight).

The defaults of the yard.

Moreover the defects or imperfections of the yard may cauſ barrenneſs: as, if it bee too ſhort, or if it bee ſo unreaſonable great, that it renteth the privie parts of the woman, and ſo cauſeth a flux of blood, for then it is ſo painful to the woman, that ſhee cannot void her ſeed, for that cannot bee excluded without pleaſure and delight, alſo if the ſhortneſs of the ligature ligament that is under the yard doth make it to bee crooked, and violate the ſtiff ſtraightneſs thereof, ſo that it cannot bee put directly or ſtraightly into the woman's privie parts. There bee ſom that have not the orifice of the conduit of the yard rightly in the end thereof, but a little higher, ſo that they cannot ejaculate or caſt out their ſeed into the womb.

The ſign of the palſie in the yard.

Alſo the particular palſie of the yard is numbred among the cauſſes of barrenneſs; and you may proov whether the palſie bee in the yard by dipping the genitals in cold water: for except they do draw themſelvs together or ſhrink up after it, it is a token of the palſie; for members that have the palſie, by the touching of cold water, do not ſhrink up, bnt remain in their accuſtomed laxitie and looſneſs: but in this caſe the genitals are endued with ſmall ſenſ; the ſeed commeth out without pleaſure or ſtiffneſs of the yard; the ſtones in touching are cold; and to conclnde, thoſe that have their bodies daily waxing lean through a conſumption, or that are vexed with an evil habit or diſpoſition, or with the obſtruction of ſom of the entrals, are barren and unfertil, and likewiſe thoſe in whom ſom noble part neceſſarie to life and generation exceedeth the bounds of nature with ſom great diſtemperature, and laſtly thoſe who by anie means have their genital parts deformed.

Magick bands and enchanted knots.

Here I omit thoſe that are withholden from the act of generation by inchantment, magick, witching and inchanted knots, bands and ligatures, for thoſe cauſſes belong not to Phyſick, neither may they bee taken away by the remedies of our Art. The Doctors of the Canon laws have made mention of thoſe magick bands which may have power in them, in the particular title *De frigidis, maleficiatis, impotentibus & incantatis*: alſo *St. Auguſt.* hath made mention of them, *Tract. 7. in Joan.*

CHAP. XXXVIII.

Of the barrenneſs or unfruitfulneſs of Women,

The cauſ why the neck of the womb is narrow.

A Woman may becom barren or unfruitful through the obſtruction of the paſſage of the ſeed, or through ſtraitneſs and narrowneſs of the neck of the womb comming either through the default of the formative facultie, or elſ afterwards by ſom miſchance, as by an abſceſs, *ſcirrhus*, warts, chaps, or by an ulcer, which being cicatrized, doth make the way more narrow, ſo that the yard cannot have free paſſage thereinto: Moreover, the membrane calle *Hymen*, when it groweth in the mid'ſt or in the bottom of the neck of the womb, hinder's the receiving of the man's ſeed. Alſo if the womb bee over-ſlipperie, or more looſ, or over wide, it maketh the woman to bee barren; ſo doth the ſuppreſſion of the menſtrual fluxes, or the too immoderate flowing of the courſes or whites: which commeth by the default of the womb, or ſom entral, or of the whole bodie, which conſumeth the menſtrual matter, & carrieth the ſeed away with it.

The membrane called *Hymen*.

The cauſ of the flux of women.

The cold and moiſt diſtemperature of the womb, extinguiſhe's and ſuffocate's the man's ſeed, and maketh it that it will not ſtay or cleav unto the womb, and ſtay till it bee concocted: but the more hot and drie doth corrupt for want of nouriſhment, for the ſeeds that are ſown either in a mariſh or ſandie ground cannot proſper well: alſo a *mola* contained in the womb, the falling down of the womb, the leanneſs of the woman's bodie, ill humors bred by eating crude and raw fruits, or great, or overmuch, whereof obſtructions and crudities follow which hinder her fruitfulneſs. Furthermore, by the uſe of ſtupefactive things, the ſeminal matter is congealed and reſtrained, and though it flow and bee caſt out, yet it is deprived

prived of the prolifick power, and of the lively heat and ſpirits, the orifices or cotylidones of the veins and arteries are ſtopped, and ſo the paſſage for the menſtrual matter into the womb, is ſtopped. When the Kall is ſo far that it girdeth in the womb narrowly, it hindereth the fruitfulneſs of the woman, becauſ it will not permit the mans ſeed to enter into the womb. Moreover the fat and fleſhie habit of the man or woman hinder generation. For it hindereth them that they cannot join their genital parts together: and by how much the more blood goeth into fat, by ſo much the leſs is remaining to bee turned into ſeed & menſtrual blood, which two are the originals and principals of generation. Thoſe women that are ſpeckled in the face, ſomwhat lean, and pale, becauſ they have their genitals moiſtned with a ſaltiſh, ſharp and tickling humor, are more given to venerie then thoſe that are red and fat. Finally, *Hippocrates* ſet's down four cauſes onely why women are barren and unfruitful. The firſt is, becauſ they cannot receiv the mans ſeed, by reaſon of the fault of the neck of the womb; the ſecond, becauſ when it is received into the womb, they cannot conceiv it; the third is, becauſ they cannot nouriſh it; the fourth, becauſ they are not able to carrie or bear it untill the due and lawful time of birth. Theſe things are neceſſarie to generation, the object, will, facultie, concourſ of the ſeeds, and the remaining or abiding thereof in the womb, untill the due and appointed natural time.

Aph 36. ſect. 5. Gal. lib. 14. de uſu par cap. 9. Ariſt. in prob. ſect. deſter. qua. 3. & 4.

CHAP. XXXIX.

The ſignes of a diſtempered womb.

THat woman is thought to have her womb too hot, whoſe courſes com forth ſparingly and with pain, and exulcerate by reaſon of their heat, the ſuperfluous matter of the blood beeing diſſolved or turned into winde by the power of the heat: whereupon that menſtrual blood that floweth forth is more groſs and black. For it is the propertie of heat, by digeſting the thinner ſubſtance, to thicken the reſt, and by aduſtion to make it more black. Furthermore, ſhee that hath her genitals itching with the deſire of copulation, will ſoon exclude the ſeed in copulation, and ſhee ſhall feel it more ſharp as it goeth through the paſſages. That woman hath too cold a womb whoſe flowers are either ſtopped, or flow ſparingly, and thoſe pale and not well colored.

The ſignes of a hot womb.

The ſignes of a cold womb.

Thoſe that have leſs deſire of copulation, have leſs delight therein, and their ſeed is more liquid and wateriſh, and not ſtaining a linnen cloth by ſticking thereunto, and it is ſparingly and ſlowly caſt forth. That womb is too moiſt that floweth continually with manie liquid excrements, which therefore will not hold the ſeed, but preſently after copulation ſuffereth it to fall out; which will eaſily cauſ abortion. The ſignes of too drie a womb appear in the little quantitie of the courſes, in the profuſion of a ſmall quantitie of ſeed, by the deſire of copulation, whereby it may bee made ſlipperie by the moiſture of the ſeed, by the fiſſures in the neck thereof, by the chaps and itching, for all things for want of moiſture will ſoon chap, even like unto the ground, which in the ſummer by reaſon of great drought or drineſs, will chap and chink this waie and that waie, and on the contrarie with moiſture it will cloſe and join together again as it were with glew.

The ſignes of a moiſt womb.

The ſignes of drie womb.

A woman is thought to have all opportunities unto conception when her courſes or flowers do ceaſ, for then the womb is void of excremental filth, and becauſ it is yet open, it will the more eaſily receiv the mans ſeed, and when it hath received it, it will better retain it in the wrinkles of the cotylidones yet gaping as it were in rough and unequal places. Yet a woman will eaſily conceav a little before the time that the flowers ought to flow: becauſ that the menſtrual matter falling at firſt like dew into the womb, is verie meet and fit to nouriſh the ſeed, and not to drive it out again, or to ſuffocate it.

A meet time for conception.

Thoſe which uſe copulation when their courſes fall down aboundantly, will verie hardly or ſeldom conceiv, and if they do conceiv, the childe vvill bee vveak and diſeaſed, and eſpecially if the vvomans blood that flovv's out bee unſound; but if the blood bee good and laudable, the childe vvill bee ſubject to all plethorick diſeaſes. There are ſom vvomen in vvhom preſently after the flux of the termes, the orifice of the vvomb vvill bee cloſed, ſo that they muſt of neceſſitie uſe copulation vvith a man vvhen their menſtrual flux flovveth, if at leaſt they vvould conceiv at all. A vvoman may bear children from the age of fourteen untill fortie or fiftie; vvhich time vvhoſoever doth exceed, vvill bear untill threeſcore yeers, becauſ the menſtrual fluxes are kept, the prolifical facultie is alſo preſerved: therefore manie vvomen have brought forth children at that age, but after that time no vvoman can bear, as *Ariſtotle* vvriteth.

Ariſt. l. 7. de hiſt. anim. c. 1. & c. 5.

Yet *Plinie* ſaith that *Cornelia* (who was of the houſ of the *Scipios*) beeing in the ſixtie ſecond yeer of her age, bear *Voluſius Saturnius*, who was Conſul; *Valeſcus de Tarenta* alſo affirmeth, that hee ſaw a woman that bear a childe on the ſixtie ſecond yeer of her age, having born before on the ſixtieth and ſixtie firſt yeer. Therefore it is to bee ſuppoſed that by reaſon of the varietie of the air, region, diet and temperament, the menſtrual flux and procreative facultie ſeaſeth in ſom ſooner, in ſom later; which varietie taketh place alſo in men.

Lib. 7. ca. 14. Lib. 6 cap. 11.

For

Lib. 7. de hiſt. e-nim. c. 1. & 5. 6. For in them although the ſeed be genitable for the moſt part in the ſecond ſeventh yeer, yet truly it is unfruitful untill the third ſeventh yeer. And whereas moſt men beget children untill they bee threeſcore yeers old, which time if they paſs, they beget till ſeventie: yet there are ſom known that have begot children untill the eightieth yeer. Moreover, *Plinie* writeth that *Maſiniſſa* the King begot a ſon when hee was fourſcore and ſix yeers of age, and *Lib. 7. cap. 14.* alſo *Cato* the Cenſor after that hee was fourſcore.

CHAP. XL.

Of the falling down, or perverſion, or turning of the womb.

What is the falling down of the womb.

THe womb is ſaid to fall down and bee perverted, when it is mooved out of its proper and natural place; as when the bands and ligatures thereof beeing looſed and relaxed, it falleth down unto one ſide or other, or into its own neck, or elſ paſſeth further, ſo that it com's out at the neck, and a great portion thereof appear's without the privie parts. Therefore what things ſoever reſolv, relax, or burſt the ligaments or bands whereby the womb is tied, are ſuppoſed to bee the cauſſes of this accident. It ſomtimes happen's by vehement labor or travail in childe-birth, when the womb with violence excluding the iſſue and the ſecundines, alſo follow's and fall's down, turning the inner ſide thereof outward. And ſomtimes the fooliſh raſhneſs of the Midwife, when ſhee draweth away the womb with the infant, or with the ſecundine cleaving faſt thereunto, and ſo drawing it down and turning the inner-ſide outward. Furthermore, a heavie bearing of the womb, the bearing or the carriage of a great burthen, holding or ſtretching of the hands or bodie upwards in the time of greatneſs with childe, a fall, contuſion, ſhaking, or jogging by rideing, either in a Waggon or Coach; or on horſ-back, or leaping or dancing, the falling down of a more large and abundant humor, great gripeing, a ſtrong and continual cough, a *Teneſmus*, or often deſire to go to ſtool, yet not voiding anie thing, neeſing, a manifold and great birth, difficult bearing of the womb, an aſtmatical and orthopnoical difficultie of breathing, whatſoever doth weightilie preſs down the *Diaphragma* or Midriff, or the muſcles of the *Epigaſtrium*, the takeing of cold air in the time of travail with childe, or in the flowing of the menſtrual flux, ſitting on a cold marble-ſtone, or anie other ſuch like cold thing, are thought often times to bee the occaſion of theſe accidents, becauſ they may bring the womb out of its place.

Ariſt. lib. 7. de hiſtor. anim. cap. 2. It fall's down in manie (ſaith *Ariſtotle*) by reaſon of the deſire of copulation that they have, either by reaſon of the luſtineſs of their youth, or elſ becauſ they have abſtained a long time from it.

The ſignes.

You may know that the womb is fallen down by the pain of thoſe parts wherehence it is fallen, that is to ſay by the entrals, loines, *os ſacrum*, and by a tractable tumor at the neck of the womb, and often with a viſible hanging out, of a diverſ greatneſs, according to the quantitie that is fallen down. It is ſeen ſomtimes like unto a piece of red fleſh, hanging out at the neck of the womb, of the bigneſs and form of a Gooſ-egg; if the woman ſtand upright, ſhee feeleth the weight to lie on her privie parts, but if ſhee ſit or lie, then ſhee perceiveth it on her back, or go to the ſtool, the ſtraight gut called *inteſtinum rectum* will bee preſſed or loaden as if it were with a burthen, if ſhee lie on her bellie, then her urine will bee ſtopped, ſo that ſhee ſhall fear to uſe copulation with a man.

The prognoſtications.

When the womb is newly relaxed in a young woman, it may bee ſoon cured, but if it hath been long down in an old woman, it is not to bee helped. If the palſie of the ligaments thereof have occaſioned the falling, it ſcarce admit's of cure, but if it fall's dovvn by means of putrefaction, it cannot poſſibly bee cured. If a great quantitie thereof hang out betvveen the thighes, it can hardly bee cured; but it is corrupted by takeing the air, and by the falling dovvn of the urine and filth, and by the motions of the thighes in going it is ulcerated, and ſo putrefie's.

A hiſtorie.

I remember that once I cured a young vvoman vvho had her vvomb hanging out at her privie parts as big as an egg, and I did ſo vvell perform and perfect the cure thereof, that aftervvards ſhee conceived, and bare children manie times, and her vvomb never fell dovvn.

CHAP. XLI.

The cure of the falling down of the womb.

Remedies for the aſcenſion of the womb.

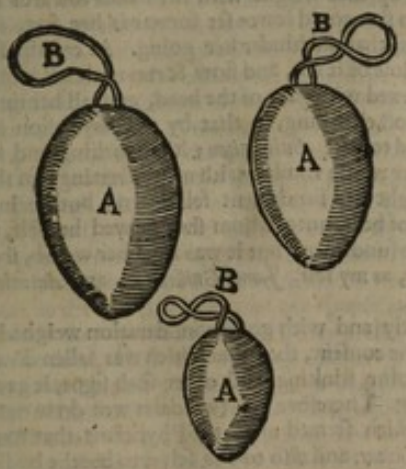
BY this vvord, falling dovvn of the vvomb, vvee underſtand everie motion of the vvomb out of its place or ſeat: therefore if the womb aſcend upwards, vvee muſt uſe the ſame medicines as in ſtrangulation of the womb. If it bee turned towards either ſide, it muſt bee reſtored and dravvn back to its right place, by applying and uſing cupping-glaſſes. But if it deſcend and fall down into its ovvn neck, but yet not in great quantitie, the vvoman muſt bee placed ſo that her buttocks may bee verie high, and her legs acroſs; then cupping-glaſſes muſt bee applied to her navel and *Hipogaſtrium*, and vvhen the

the womb is ſo brought into its place, injections that binde and drie ſtrongly muſt bee injected into the neck of the womb, ſtinking fumigations muſt bee uſed unto the privie parts, and ſweet things uſed to the mouth and noſe. But if the womb hang down in great quantitie between the thighs, it muſt be cured by placing the woman after another ſort, and by uſing other kinde of medicines. Firſt of all ſhee muſt bee ſo laied on her back, her buttocks and thighs ſo lifted up, and her legs ſo drawn back as when the childe or ſecundine are to bee taken or drawn from her; then the neck of the womb, and whatſoever hangeth out thereat, muſt be anointed with oil of lillies, freſh butter, capons greaſ, and ſuch like, then it muſt be thruſt gently with the fingers up into its place, the ſick or pained woman in the mean time helping or furthering the endeavour by drawing in of her breath as if ſhe did ſup, drawing up as it were that which is fallen down.

For the falling down of the womb, properly ſo called.

After that the womb is reſtored unto its place, whatſoever is filled with the ointment muſt bee wiped with a ſoft and clean cloth, leſt that by the ſlipperineſs thereof the womb ſhould fall down again; the genitals muſt bee fomented with an aſtringent decoction, made with pomegranate pils, cypreſs nuts, gals, roach allom, horſ-tail, ſumach, berberies, boiled in the water wherein Smiths quench their irons; of theſe materials make a powder, wherewith let thoſe places bee ſprinkled: let a peſſarie of a competent bigneſs bee put in at the neck of the womb, but let it bee eight or nine fingers in length, according to the proportion of the grieved patient's bodie. Let them bee made either with latin, or of cork covered with wax, of an oval form, haveing a thread at one end, whereby they may bee drawn back again as need require's.

The forms of oval peſſaries.



A. *ſheweth the bodie of the Peſſarie.*
B. *ſheweth the thread wherewith it muſt be tied to the thigh.*

When all this is don, let the ſick woman keep her ſelf quiet in her bed, with her buttocks lying verie high, and her legs acroſs, for the ſpace of eight or ten daies: in the mean while the application of cupping glaſſes will ſtaie the womb in the right place and ſeat after it is reſtored thereunto: but if ſhee hath taken any hurt by cold air, let the privie parts bee fomented with a diſcuſſing and heating fomentation, on this wiſe. R. *fol. alth. ſalv. lavend. roriſmar. artemiſ. flor. chamæm. melilot. an.* m ß. *ſem. aniſ. fœnugr. an.* ℥ i. let them bee all well boiled in water and wine, and make thereof a decoction for your uſe. Give her alſo glyſters, that when the guts are emptied of the excrements, the womb may the better bee received into the void and emptie capacitie of the bellie: for this reaſon the bladder is alſo to bee emptied, for otherwiſe it were dangerous leſt that the womb lying between them both beeing ful, ſhould bee kept down and cannot bee put up into its own proper place by reaſon thereof. Alſo vomiting is ſuppoſed to bee a ſingular remedie to draw up the womb that is fallen down: furthermore alſo it purgeth out the phlegm which did moiſten and relax the ligaments of the womb; for as the womb in the time of copulation at the beginning of the conception is moved downwards to meet the ſeed, ſo the ſtomack, even of its own accord, is lifted upwards when it is provoked by the injurie of anie thing that is contrarie unto it, to caſt it out with greater violence, but when it is ſo raiſed up, it draw's up together therewith the *peritonæum*, the womb, and alſo the bodie or parts annexed unto it. If it cannot bee cured or reſtored unto its place by theſe preſcribed remedies, and that it bee ulcerated and ſo putrefied that it cannot be reſtored unto his place again, we are commanded by the precepts of art to cut it away, and then to cure the womb according to art, but firſt it ſhould be tied, and as much as is neceſſarie muſt bee cut off, and the reſt ſeared with a cauterie. There are ſom women that have had almoſt all their womb cut off, without anie danger of their life, as *Paulus* teſtifieth.

A diſcuſſing and hearing fomentation.

How vomiting is profitable to the falling down of the womb.

The cutting away of the womb when it is putrefied. *Lib. 6. Epiſt. 39. lib. 2.*

John Langius Phyſician to the Count *Palatine*, writeth that *Carpus* the Chirurgian took out *Epiſt. med.*

the womb of a woman of *Bononia*, hee beeing present, and yet the woman lived and was verie well after it. *Antonius Benivenius* Physician of *Florence*, writeth that hee was called by *Vgolius* the Physician to the cure of a woman whose womb was corrupted and fell away from her by pieces, and yet shee lived ten years after it.

Trac. de mirand. morb. caus.

An Historie.

There was a certain woman, beeing sound of bodie, of good repute, and about the age of thirtie years, in whom, shortly after shee had been married the second time, which was in *Anno* 2571. haveing no childe by her first husband, the lawful signs of a right conception did appear: yet in process of time there arose about the lower part of her privities the sens or feeling of a weight or heavines, beeing so troublesom unto her by reason that it was painful, and also for that it stopped her urine, that shee was constrained to disclose her mischance to *Christopher Mombey* a Surgeon her neighbor dwelling in the Suburbs of S. *Germans*; who haveing seen the tumor or swelling in her groin, asswaged the pain with mollifying, and anodyne fomentations and cataplasms; but presently after hee had don this, hee found on the inner side of the lip of the orifice of the neck of the womb, an impostume rotten and running, as if it had been out of an abscess newly broken, with sanious matter, somwhat red, yellow, and pale, running a long time. Yet for all this the feeling of the heavines or weight was nothing diminished, but did rather encreas daily, so that from the year of our Lord 1573. shee could not turn herself beeing in her bed on this or that side, unless shee laid her hand on her bellie to bear and eas herself of the weight, and also shee said when shee turned herself, shee seem to feel a thing like unto a bowle to rowle in her bodie unto the side whereunto shee turned her self, neither could shee go to stool, or avoid her excrements standing or sitting, unless shee lifted up that weight with her hands towards her stomach or midriff: when shee was about to go shee could scarce set forwards her feet, as if there had somthing hanged between her thighs, that did hinder her going. At certain seasons that rotten apostume would open or unclose of it self, and flow & run with it's wonted sanious matter, but then shee was grievously vexed with pain of the head, and all her members, swouning, loathing, vomiting, and almost choaking, so that by the perswasion of a foolish woman shee was induced and contented to take *Antimonium*; the working and strength thereof was so great and violent, that after manie vomits, with manie frettings of the guts and watrie dejections or stools, shee thought her fundament fell down; but beeing certified by a woman that was a familiar friend of hers, unto whom shee shewed her self, that there was nothing fallen down at or from her fundament, but it was from her womb, shee called, in the year of our Lord 1575. Surgeons, as my self, *James Guillemeau*, and *Antonie Vieux*, that wee might help her in this extremitie.

Antimonium taken in a potion doth caus the womb to fall down.

The signs of the substance of the womb drawn out.

When wee had diligently and with good consideration weighed the whole estate of her disease, wee agree'd with one consent, that that which was fallen down should bee cut away, becaus that by the black color, stinking, and other such signs, it gave a testimonie of a putrefied and corrupted thing. Therefore for two daies wee drew out the bodie by little and little, and piece-meal, which seemed unto the Physicians that wee had called, as *Alexius*, *Gaudinus*, *Feureus*, and *Violaneus*, and also to our selvs, to bee the bodie of the womb, which thing wee prooved to bee so, becaus one of the testicles came out whole, and also a thick membrane or skin, beeing the relick of the *mola*, which beeing suppurated, and the abscess broken, came out by little and little in matter; after that all this bodie was so drawn away, the sick woman began to wax better and better, yet notwithstanding for the space of nine daies before it was taken away, shee voided nothing by siege, and her urine also was stopped for the space of four daies.

After this all things became as they were before, and shee lived in good health three months after, and then died of a Pleurisie that came on her verie suddenly, and I haveing opened her bodie, observing and marking everie thing verie diligently, could not finde the womb at all, but in stead thereof there was a certain hard and callous bodie, which Nature, who is never idle, had framed in stead thereof, to supplie the want thereof, or to fill the hollownes of the bellie.

CHAP. XLII.

Of the tunicle or membrane called Hymen.

Whether there bee a membrane called *Hymen*.

IN som virgins or maidens in the orifice of the neck of the womb there is found a certain tunicle or membrane called of antient writers *Hymen*, which prohibiteth the copulation of a man, and causeth a woman to be barren; this tunicle is supposed by manie, and they not of the common sort onely, but also learned Physicians, to bee, as it were, the enclosure of the virginitie or maiden-head. But I could never finde it in anie, seeking of all ages from three to twelv, of all that I had under my hands in the Hospital of *Paris*.

An Historie.

Yet once I saw it in a virgin of seventeen yeers, whom her mother had contracted to a man, and shee knew nevertheles there was somthing in her privie parts that hindered her from

from bearing of children, who desired mee to see her; and I found a verie thin nervous membrane a little beueath the *nymphæ*, neer unto the orifice of the neck of the womb; in the midst there was a verie little hole whereout the terms might flow: I seeing the thickness thereof, cut it in sunder with my scissars, and told her mother what shee should do afterwards: and truly shee married shortly after and bore children. *Realdus Columbus* is of my opinion, and saith that this is seen verie seldom, for these are his words: under the *nymphæ* in manie, but not in all virgins, there is another membrane, which when it is present (which is but seldom) it stoppeth, so that the yard cannot bee put into the orifice of the vvomb; for it is verie thick aboov tovvards the bladder, it hath an hole by vvhich the courses flovv out. And hee also addeth, that hee observed it in tvvo young virgins, and in one elder maid. *Lib.11.cap.16.*

Avicen writeth, that in virgins in the neck of the womb there are tunicles composed of veins and ligaments verie little, riseing from each part of the neck whereof, which at the first time of copulation are wont to bee broken, and the bloud to run out. *Almansor* writeth, that in virgins, the passage of the neck of the womb is verie wrinkled, or narrow and straight, and those wrinkles to be woven or staied together with manie little veins and arteries, which are broken at the first time of copulation. *Lib.3. sent.21. tract.1.cap.1.*

These are the judgments of Physitians of this membrane: Midwives will certainly affirm that they know a virgin from one that is defloured, by the breach or soundness of that membrane. But by their report too credulous Judges are soon brought to commit an error. For that Midwives can speak nothing certainly of this membrane, may bee proved by this, becaus that one saith that the situation thereof is in the verie entrance of the privie parts, others saie it is in the midst of the neck of the womb, and others saie it is within at the inner orifice thereof, and som are of an opinion that they saie or suppose that it cannot be seen or perceived before the first birth. But truly of a thing so rare, and which is contrarie to nature, there cannot be anie thing spoken for certaintie. Therefore the blood that commeth out at the first time of copulation, come's not alwaies by the breaking of that membrane, but by the breaking and violating or renting of the little veins which are woven and bespread all over the superficial and inward parts of the womb and neck thereof, descending into the wrinkles, which in those that have not yet used the act of generation, are closed as if they were glewed together: although that those maids that are at their due time of marriage, feel no pain nor no flux of blood, especially if the man's yard be answerable to the neck of the womb; whereby it appear's evidently how greatly the inhabitants of *Fez*, the metropolitan citie of *Mauritania*, are deceived: for *Leo* the Affrican writeth, that it is the custom among them, that so soon as the married man and his spouse are returned home to their hous from the church where they have been married, they presently shut themselves into a chamber, and make fast the door, while the marriage dinner is preparing: in the mean while som old or grave matron standeth waiting before the chamber door, to receiv a bloodie linnen cloth the new married husband is to deliver her there, which when sheehath received, shee bring's it into the midst of all the companie of guests, as a fresh spoil and testimonie of the married wives virginitie, and then for joie thereof they all fall to banquetting solemnly. But if through evil fortune it happeneth that in this time of copulation the spous bleedeth not in the privie parts, shee is restored again unto her parents, which is a verie great reproach unto them, and all the guests depart home sad, heavie, and without dinner.

The trifles of midwives about the membrane called *Hymen*.

What virgins at the first time of copulation do not bleed at their privie parts. *Lib.3.*

Moreover, there are som, that having learned the most filthie and infamous arts of bawderie, prostitute common harlots to make gain thereof, making men that are naughtily given to beleev that they are pure virgins, making them to think that the act of generation is verie painful and grievous unto them, as if they had never used it before, although they are verie expert therein indeed; for they do caus the neck of the womb to be so wrinkled and shrunk together, so that the sides thereof shall even almost close or meet together, then they put thereinto the bladders of fishes, or galls of beasts filled full of blood, and so deceiv the ignorant and young lecher, by the fraud and deceit of their evil arts, and in the time of copulation they mix sighs with groanes, and womanlike cryings, and the crocodiles tears, that they may seem to be virgins, and never to have dealt with man before..

The filthie deceit of bauds and harlots.

CHAP. XLIII.

A memorable historie of the membrane called Hymen.

John Wierus writeth that there was a maid at Camburge, who in the middest of the neck of the womb, had a thick and strong membrane growing overthwart, so that when the monethlie tearms should come out, it would not permit them, so that thereby the menstrual matter was stopped and flowed back again, which caussed a great tumor and distension in the bellie, with great torment, as if shee had been in travell with childe: the midwives beeing called, and having seen and considered all that had been don, and did appear, did all with one voice affirm, that shee sustained the pains of childe-birth, although that the maid her self denied that shee ever dealt with man. Therefore then this foresaid Author was called, who *Lib. de prost. dæmon.cap.38.*

who, when the midwives were void of help and counsel, might help this wretched maid haveing alreadie had here urine stopped now three whole weeks, and perplexed with great watchings, loss of appetite, and loathing: and when hee had seen the grieved place, and marked the orifice of the neck of the womb, hee saw it stopped with a thick membrane; hee knew also that that sudden breaking out of bloud into the womb and the vessels thereof, and the passage for those matters that was stopped, was the caus of her grievous and tormenting pain. And therefore hee called a Chyrurgian presently, and willed him to divide the membrane that was in the midst, that did stop the flux of bloud, which beeing don, there came forth as much black congealed and putrefied bloud as as waighed som eight pounds. In three daies after shee was well and void of all diseas and pain. I have thought it good to set down this example here, becaus it is not worthie to bee noted, and profitable to bee imitated, as the like occasion shall happen.

CHAP. XLIIII.

Of the strangulation of the womb.

What is the strangulation of the womb.

THe strangulation of the womb, or that which commeth from the womb, is an interception or stopping of the libertie in breathing or takeing winde, becaus that the womb, swoln or puffed up by reason of the access of gross vapors and humors that are contained therein, and also snatched as it were by a convulsive motion, by reason that the vessels and ligaments distended with fulnes, are so carried upwards against the midriff and parts of the breast, that it maketh the breath to bee short, and often as if a thing lay upon the breast and pressed it.

Why the womb swelleth.

Moreover, the womb swelleth, becaus there is contained or inclosed in it a certain substance, caused by the defluxion either of the seed or flowers, or of the womb or whites, or of som other humor, tumor, abscess, rotten apostume, or som ill juice, putrefying, or getting, or ingendering an ill qualitie, and resolved into gross vapors. These, as they affect sundry or divers places, infer divers and sundrie accidents, as rumbling and noise in the bellie, if it bee in the guts, desire to vomit, after (with seldom vomiting) commeth wearines and loathing of meat, if it trouble the stomach. Choaking with strangulation, if it assail the breast and throat; swooning, if it vex the heart; madnes, or else that which is contrarie thereto, sound sleep or drousines, if it griev the brain: all which oftentimes proov as malign as the biteing of a mad dog, or equal the stinging or biteings of venemous beasts.

The accidents that com of the strangling of the womb.

What the strangulation that commeth of the corruption of the seed is more dangerous then that that com's of the corruption of the bloud.

It hath been observed, that more grievous symptomes have proceeded from the corruption of the seed, then of the menstrual bloud. For by how much everie thing is more perfect and and noble, while it is contained within the bounds of the integritie of it's own nature, by so much it is the more grievous and perillous, when by corruption it hath once transgressed the laws thereof. But this kinde of accident doth verie seldom griev those women which have their menstrual flux well and orderly, and do use copulation familiarly; but verie often those women that have not their menstrual flux as they should, and do want, and are destitute of husbands, especially if they bee great eaters, and lead a solitarie life. When the vessels and ligaments of the womb are swollen and distended as we said before, so much as is added to their latitude or bredth, so much is wanting in their length: and therefore it hapneth that the womb, beeing remooved out of it's seat, doth one while fall to the right side towards the liver, somtimes to the left towards the milt, somtimes upwards unto the midriff and stomach, somtimes downwards, and so forwards unto the bladder, whereof commeth an Ischurie and strangurie; or backwards, whereof commeth oppression of the straight gut, and and suppression of the excrements, and the *Tenesmus*.

The caus of the divers turning of the womb into divers parts of the bodie.

The womb is not so greatly mooved by an accident, but by it self.

But although wee acknowledg the womb to decline to those parts which wee named, yet it is not by accident onely, as when it is drawn by the proper and common ligaments and bands, when they are contracted or made shorter, beeing distended with fulnes, but also of it's self, as when it is forced or provoked through the grief of somthing contrarie to nature that is contained therein: it wandreth somtimes unto one side, and somtimes unto another part with a plain and evident natural motion, like unto the stomach which imbraceth anie thing that is gentle and milde, but avoideth anie thing that is offensive and hurtful; yet wee denie that so great accidents may bee stirred up by the falling of it alone unto this or that side, for then it might happen, that women that are great with childe, whose wombs are so distended by reason that the childe is great, that it doth pres the midriff, might bee troubled with a strangulation like unto this; but much rather by a venemous humor breathing out a malign and gross vapor, not onely by the veins and arteries, but also by the pores that are invisible, which pollute's the faculties of the parts which it toucheth with it's venomous malignitie and infection, and intercept's the functions thereof. Neither doth the varietie of the parts receiving onely, but also of the matter received, caus varietie of accidents.

Whereof com such divers accidents of strangulation of the womb.

For som accidents com by suppression of the terms, others com by corruption of the seed,

ſeed, but if the matter bee cold, it bringeth a drouſineſs, beeing lifted up unto the brain, whereby the woman ſinketh down as if ſhee were aſtoniſhed, and lieth without motion, and ſenſ or feeling, and the beating of the arteries, and the breathing are ſo ſmall, that ſomtimes it is thought they are not at all, but that the woman is altogether dead. If it be more groſs, it interreth a convulſion; if it participate of the nature of a groſs melancholick humor, it bringeth ſuch heavineſs, fear, and ſorrowfulneſs, that the party that is vexed therewith ſhall ſhall think that hee ſhall die preſently, and cannot bee brought out of his minde by anie means or reaſon: if of a cholerick humor, it cauſſeth the madneſs called *furor uterinus*, and ſuch a pratling, that they ſpeak all things that are to bee concealed; and a giddineſs of the head, by reaſon that the animal ſpirit is ſuddenly ſhaken by the admixtion of a putrefied vapour and hot ſpirit: but nothing is more admirable, then that this diſeaſ taketh the patient ſomtimes with laughing, and ſomtimes with weeping, for ſom at the firſt will weep and then laugh in the ſame diſeaſ and ſtate thereof.

The cauſ of ſleepineſs in the ſtrangulation of the womb.

The cauſ of a drouſie madneſs.

But it exceedeth all admiration which *Hollerius* writeth uſually happened to two of the daughters of the Provoſt of Roven. For they were held with long laughter for an hour or two before the fit, which neither for fear, admonition, nor for any other means they could hold; and their parents chid them, and asked them wherefore they did ſo, they anſwered, that they were not able to ſtay their laughter. The aſſcention of the womb is diligently to bee diſtinguiſhed from the ſtrangulation thereof; for the accidents of the aſſcention and of the ſtrangulation are not one, but the woman is onely oppreſſed with a certain pain of the heart, difficultie of breathing, or ſwouning, but yet without fear, without raveing or idle talking, or any other greater accident.

A hiſtorie.

The aſſcention of the womb is to bee diſtinguiſhed from the ſtrangulation.

Therefore ottentimes contrary cauſſes infer the aſſcention: that is, overmuch drineſs of the womb, laboring through the defect of moiſture, whereby it is forced after too violent and immoderate evacuations of the flowers, and in childe-bed, and ſuch like, and laborious and painful travel in childe-bed, through which occaſion it waxeth hot, contrary to nature, and withereth and turneth it ſelf with a certain violence unto the parts adjoining, that is to ſay, unto the liver, ſtomach and midriff: if haply it may draw ſom moiſture therehence unto it. I omit that the womb may be brought unto it's place upwards by often ſmelling to aromatick things, yet in the mean while it infer's not the ſtrangulation that wee deſcribed before.

CHAP. XLV.

The ſigns of imminent ſtrangulation of the womb.

BEfore that theſe fore-named accidents com, the woman think's that a certain painfull thing ariſeth from her womb unto the orifice of the ſtomach and heart, and ſhee thinketh her ſelf to bee oppreſſed and choaked, ſhee complaineth her ſelf to bee in great pain, and that a certain lump or heavie thing clime's up from the lower parts unto her throat, and ſtoppeth her winde, her heart burneth and panteth. And in manie the womb and veſſels of the womb ſo ſwell, that they cannot ſtand upright on their legs, but are conſtrained to lie down flat on their bellies, that they may bee the leſs grieved with the pain, and to preſs that down ſtrongly with their hands, that ſeemeth to ariſe upwards, although that not the womb it ſelf, but the vapor aſſcendeth from the womb, as wee ſaid before: but when the fitt is at hand, their faces are pale on a ſudden, their underſtanding is darkned, they becom ſlow and weak in the legs, with unableneſs to ſtand. Hereof commeth ſound ſleep, fooliſh talking, interception of the ſenſes, and breath as if they were dead, loſs of ſpeech, the contraction of their legs, and the like.

The womb it ſelf doth not ſo well make the aſſcention as the vapor thereof.

CHAP. XLVI.

How to know whether the woman bee dead in the ſtrangulation of the womb, or not.

HAve thought it meet (becauſ manie women, not onely in ancient times, but in our own and our fathers memorie have been ſo taken with this kinde of ſymptome, that they have been ſuppoſed and laid out for dead, although truly they were alive:) to ſet down the ſigns in ſuch a caſe which do argue life and death. Therefore firſt of all it may be prooved, whether ſhee bee alive or dead, by laying or holding a clear and ſmooth looking-glaſs before her mouth and noſtrils. For, if ſhee breath, although it bee never ſo obſcurely, the thin vapor that commeth out will ſtain or make the glaſs duskie. Alſo a fine douniſh feather taken from under the wing of any bird, or elſ a fine ſlock beeing held before the mouth, will by the trembling or ſhakeing motion thereof, ſhew that there is ſom breath, and therefore life remaining in the bodie. But you may proov moſt certainly whether there bee anie ſpark of life remaining in the bodie, by blowing ſom ſneeſing powders of pellitorie of Spain, and elebore into the noſtrils. But though there no breath appear, yet

Women liveing taken for dead.

How women that have the ſuffocation of the womb, live onely by tranſpiration without breathing

must you not judg the woman for dead, for the ſmall vital heat, by which, beeing drawn into the heart, ſhee yet liveth, is contented with tranſpiration onely, and require's not much attraction, which is perſormed by the contraction and dilatation of the breaſt and lungs unto the preſervation of it's ſelf. For ſo flies, gnats, piſmires and ſuch like, becauſ they are of a cold temperament, live unmoovably incloſed in the caves of the earth, no token of breathing appearing in them, becauſ there is a little heat left in them, which may bee conſerved by the office of the arteries and heart, that is to ſay, by perſpiration, without the motion of the breaſt, becauſ the greateſt uſe of reſpiration is, that the inward heat may bee preſerved by refrigeration and ventilation. Thoſe that do not mark this, fall into that error which almoſt coſt the life of him who in our time firſt gave life to anotomical adminiſtration, that was almoſt decaied and neglected.

How flies, gnats and piſmires do live all the winter without breathing.

For hee beeing called in Spain to open the bodie of a noble woman which was ſuppoſed dead through ſtrangulation of the womb, behold, at the ſecond impreſſion of the inciſion knife, ſhee began ſudddenly to com to her ſelf, and by the mooving of her members and bodie, which was ſuppoſed to bee altogether dead, and with crying, to ſhew manifeſt ſigns that there was ſom life remaining in her. Which thing ſtrook ſuch an admiration and horror into the hearts of all her friends that were preſent, that they accounted the Phyſician, beeing before of a good fame and report, as infamous, odious and deteſtable, ſo that it wanted but little but that they would have ſcratched out his eies preſently: wherefore hee thought there was no better waie for him, if hee would live ſafe, then to forſake the countrie. But neither could hee ſo alſo avoid the horrible prick and inward wound of his conſcience (from whoſe judgment no offender can bee abſolved) for his inconſiderate dealing, but within few daies after, beeing conſumed with ſorrow, hee died, to the great loſs of the Common-wealth, and the art of Phyſick.

A hiſtorie.

CHAP. XLVII.

How to know whether the ſtrangulation of the womb com's of the ſuppreſſion of the flowers, or the corruption of the ſeed.

The ſigns of ſuffocation of the womb comming of corrupt ſeed.

THere are two chief cauſſes eſpecially, as moſt frequently happening of the ſtrangulation of the womb: but when it proceedeth from the corruption of the ſeed, all the accidents are more grievous and violent: difficultie of breathing goes before, and ſhortly after com's deprivation thereof; the whole habit of the bodie ſeemeth more cold then a ſtone: the woman is a widow; or elſ hath great ſtore or abundance of ſeed, and hath been uſed to the companie of a man, by the abſence whereof ſhee was before wont to be pained with heavineſs of the head, to loath her meat, and to bee troubled with ſadneſs and fear, but chiefly with melancholie. Moreover when ſhee hath ſatiſfied, and everie waie fulfilled her luſt, and then preſently on a ſudden begin's to contain her ſelf. It is verie likely that ſhee is ſuffocated by the ſuppreſſion of the flowers, which formerly had them well and ſufficiently, which formerly had been fed with hot, moiſt and manie meats, and therefore engendring much bloud, which ſitteth much, which is grieved with ſom weight and ſwelling in the region of the bellie, with pain in the ſtomach, and a deſire to vomit, and with ſuch other accidents as com by the ſuppreſſion of the flowers. Thoſe who are free'd from the fit of the ſuffocation of the womb, either by nature or by art, in a ſhort time their color commeth into their faces by little and little, and the whole bodie beginneth to wax ſtrong, and the teeth, that were ſet and cloſed faſt together, begin (the jaws beeing looſed) to open and uncloſe again, and laſtly, ſom moiſture floweth from the ſecret parts with a certain tickling pleaſure; but in ſom women, as in thoſe eſpecially in whom the neck of the womb is tickled with the Midwives finger, inſtead of that moiſture com's thick and groſs ſeed, which moiſture or ſeed when it is fallen, the womb beeing before as it were rageing, is reſtored unto it's own proper nature and place, and by little and little all ſymptoms vaniſh away. Men by the ſuppreſſion of their ſeed have not the like ſymptomes as women have, becauſ mans ſeed is not ſo cold and moiſt, but far more perfect and better digeſted, and therefore more meet to reſiſt putrefaction, and whiles it is brought or drawn together by little and little, it is diſſipated by great and violent exerciſe.

The ſigns when it com's of the ſuppreſſion of the flowers.

The ſigns of one recovering of or from the ſuffocation of the womb.

Why the ſuppreſſion of the ſeed is not perilous or deadly to men.

CHAP. XLVIII.

Of the cure of the Strangulation of the womb.

SEeing that the ſtrangulation of the womb is a ſudden and ſharp diſeaſ, it therefore requireth a preſent and ſpeedie remedie, for if it bee neglected it manie times cauſeth preſent death. Therefore, when this maladie commeth, the ſick woman muſt preſently bee placed on her back, haveing her breaſt and ſtomach looſ, and all her cloaths & garments ſlack & looſ about her, whereby ſhee may take breath the more eaſily; and ſhee

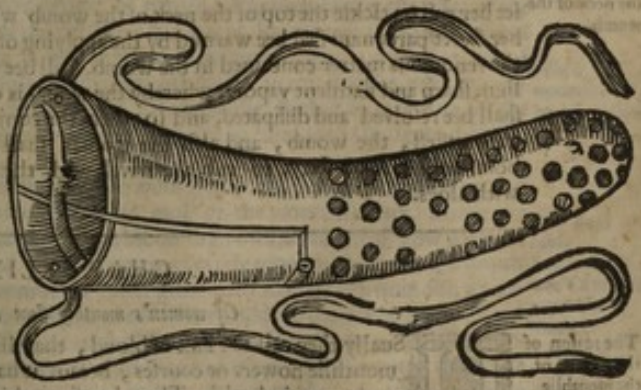
The pulling of the hairs of the lower parts are profitable both for this maladie and for the cauſ of the ſame.

ſhee muſt be called on by her own name, with a loud voice in her ears, and pulled hard by the hairs of the temples and neck, but yet eſpecially by the hairs of the ſecret parts, that by provokeing or cauſſing pain in the lower parts, the patient may not onely bee brought to her ſelf again, but alſo that the ſharp and malign vapor aſcending upwards, may bee drawn downwards: the legs and arms muſt bee bound and tied with painful ligatures, all the bodie muſt bee rubbed over with rough linnen clothes beſprinkled with ſalt and vineger, until it bee verie ſore and red, and let this peſſarie following bee put into the womb. ℞. *ſucci mercurial. artemiſ. an.* ℥ ii. *in quibus diſſolve pul. bened.* ʒ iii. *pul radic. enule comp. galang. minor. an.* ʒ. i. make thereof a peſſarie. Then let the ſoals of her feet bee annointed with oil of baies, or with ſom ſuch like oil, let a great cupping-glaſs with a great flame bee applied to the bellie below the navel, to the inner part of the thigh, and to the groin, whereby both the matter that climes upwards, and alſo the womb it ſelf running the ſame waie, may bee brought downwards or drawn back. There may bee made a fumigation of ſpices to bee received up into the womb, which, that it may bee the eaſier don, the womb may bee held open by putting in this inſtrument here deſcribed into the neck thereof. Let it bee made of gold, ſilver or latin into the form of a peſſarie; at the one end thereof, that is to ſay, that end which goeth up into the neck of the womb, let there bee made manie holes on each ſide, but at the lower end let it bee made with a ſpring, that it may open and ſhut as you will have it. Alſo it muſt have two laces or bands by which it muſt bee made faſt unto a ſwathe or girdle tied about the patient's bellie.

A Peſſarie.

The deſcription of a veſſel made with a funnel or pipe for to fumigate the womb.

The form of a Peſſarie to bee put in the neck of the womb to hold it open.



The

The matter of sweet fumigations.

The matter and ingredients of sweet and aromatick fumigations, are cinnamom, callam. aromat. lig. aloes, ladanum, benzoin, thyme, pepper, cloves, lavander, calaminth, mugworth, penniroyal, *alepta moschat.* nutmegs, musk, amber, squinant, and such like, which for their sweet smell and sympathie, allure or entice the womb downwards, by their heat consume and digest the thick vapors, and putrefied ill juice. Contrariwise, let the nostrils bee perfumed with fetid and rank smels, and let these bee made with *gum. galbanum, sagapenum, ammoniacum, assa fœtida, bitumen*, oil of Jeat, snuff of a tallow-candle when it is blown out, with the fume of bird's fethers, especially of Partridges and Woodcocks, of man's hair or goat's hair, of old lether, of horse hoofs, and such like things burned, whose noisom or offensive savor the womb avoiding, doth return unto its own place or seat again.

By what power sweet fumigations do restore the womb unto its own nature and place.

Stinking smels to bee applied to the nostrils.

Moreover it shall bee verie necessarie to procure vomit by thrusting a goose fether down into the throat, or elss the hairs of the patient's own head. Shortly after shee must use a potion of fifteen grains of black pepper bruised and dissolved in *hydromel*, or water and honie mixed together, or in som strong wine, which remedie *Avicen* holdeth for a secret.

Avicen's secret for suffocation of the womb.

Also in stead thereof three hours before meat ʒß. of Treacle dissolved In ʒi. of the water of wormwood may bee given her : Also it is thought that one drop of the oil of Jeat dropped on the tongue, is a verie profitable remedie. There bee som that allow a potion of half a dram of *Castoreum* dissolved in white wine, or in the broth of a Capon ; also it is profitable not onely to give her Treacle to drink, but also to inject it into the womb, beeing first dissolved in *aqua vitæ*, and in the mean time to drop two drops of oil of Sage, or som such Chimical oil, into the ears. If shee bee drowsie or sleepie, shee must bee awaked or kept wakeing with sneesing powders, of white hellebore and pellitorie.

Castoreum drunken.

Expressions into the womb.

The matter of pessaries.

It is also requisite to inject glysters both into the fundament and secret parts, which must bee made of the decoction of things that discuss winde, as of calamint, mugwort, lavander, penniroyal, cammomil, melilot, and such like ; and let pessaries or suppositories bee made of ladanum, ginger, *gallia moschat.* treacle, mithridate, civet and musk, of the oil of cloves, annis-seeds, sage, rosemarie, and such like, chymically drawn ; this following is a convenient description of a glyster. ℞. *radic. enulæ, ɔamp. Ireos, ebuli, aristoloch. an.* ʒi. *fol. absynth. artemesiæ, matricar. puleg. origani, an.* m.i. *baccarum lauri, juniperi & sambuc. an* p.i. *sem anios, cymini, rutæ, an* ʒii. *florum stœchados, rorismarin. salviæ, centaur. minor. an.* p.ii. *fiat decoctio, cape colaturæ* ℔.i. *in quâ dissolve mellis anthosati, sacc. rubr. & benea an.* ʒi. *diacharth.* ʒii. *olei anetb. mard, an* ʒiß. make thereof a glyster, and and applie this plaister following to the bellie. ℞. *mass empl. oxycrocei, & melilot. an.* ʒiii. *olei nard.* as much as shall suffice to make it conveniently soft, make thereof a plaster, and spread it on leather, and applie it to the region of the bellie when the fit is ended : if shee bee married, let her forthwith use copulation, and bee strongly encountered by her husband, for there is no remedie more present then this.

A glyster scattering grosse vapors.

A quick, certain and a pleasant remedie for the suffocation of the womb.

Let the midwife annoint her fingers with *oleum nardinum* or *moschetalinum*, or of cloves, or elss of spike mixed with musk, ambergreese, civet, and other sweet powders, and with these let her rub or tickle the top of the neck of the womb which toucheth the inner orifice ; but her secret parts must first bee warmed by the applying of warm linnen cloaths, for so at length the venomous matter contained in the womb, shall bee dissolved and flow out, and the malign, sharp and flatulent vapors, whereby the womb is driven as it were into a furie or rage, shall bee resolved and dissipated, and so when the conjunct matter of the disease is scattered and wasted, the womb, and also the woman shall bee restored unto themselvs again. Som hold it for a secret to rub the navel with the juice of garlick boiled and mixed with aloes.

Tickling of the neck of the womb.

CHAP. XLIX.

Of women's monthly flux or courses.

The reason of the names of the monthlie flux of women.

Usually they call the flux of bloud, that issueth from the secret parts of women, monthlie flowers or courses, becaus it happenth to them everie month so long as they are in health. There bee som which call them terms, becaus they return at their usual time. Manie of the French men call it sepmains, becaus in such as sit much, and are given to plentifull feeding, it endureth almost for the space of seven daies. Som call them purgations, becaus that by this flux all a woman's bodie is purged of superfluous humors. There bee som also that call those fluxes the flowers, becaus that as in plants the flower budeth out before the fruits ; so in women kinde this flux goeth before the issue, or the conception thereof.

For the courses flow not before a woman bee able to conceiv ; for how should the seed beeing cast into the womb have his nourishment and increas, and how should the childe have his nourishment when it is formed of the seed, if this necessarie humor were wanting in the womb ? yet it may bee som women may conceiv without the flux of the courses : but that is in such as have so much of the humor gathered together, as is wont to remain in those which are purged, although it bee not so great a quantitie that it may flow out, as it is recorded by

What women do conceiv, this flux not appearing at all.

by *Aristotle*. But as it is in som verie great, and in som verie little, so it is in som seldom, and in som verie often.

There are som that are purged twice, and som thrice in a moneth, but it is altogether in those who have a great liver, large veins, and are filled and fed with many and greatly nourishing meats, which sit idlely at home all day, which haveing slept all night, do notwithstanding lie in bed sleeping a great part of the day also, which live in a hot, moist, rainie and southerly air, which use warm baths of sweet waters and gentle frictions, which use and are greatly delighted with carnal copulation: in these and such like women the courses flow more frequently and abundantly. What women have this menstrual flux often, abundantly, and for a longer space then others.

But contrariwise, in those that have small and obscure veins, in those that have their bodies more furnished and big either with flesh or with fat, are more seldom purged, and also more sparingly, becaus that the superfluous quantitie of blood useth to go into the habit of the bodie. Also tender, delicate and fair women are less purged than those that are brown and endued with a more compact flesh, becaus that by the raritie of their bodies, they suffer a greater wasting or dissipation of their substance by transpiration. Moreover, they are not so greatly purged with this kinde of purgation, which som other solemn or accustomed evacuation in anie other place of their bodie, as by the nose or hemorrhoids. What women have this flux more seldom, less, and a far more short time then others.

And as concerning their age, old women are purged when the Moon is old, and young women when the Moon is new, as it is thought. I think the caus thereof is, for that the Moon ruleth moist bodies, for by the variable motion thereof the Sea floweth and ebbeth, and bones, marrow and plants abound with their genital humor. Why young women are purged in the new of the Moon.

Therefore young people which have much blood, and more fluxible, and their bodies more fluxible, are soon moved unto a flux, although it bee even in the first quarter of the Moon's rising or increasing: but the humors of old women, becaus they wax stiff as it were with cold, and are not so abundant, and have more dens bodies and straighter vessels, are not so apt to a flux, nor do they so easily flow, except it bee in the full of the Moon, or elf in the decreas; that is to say, becaus the blood that is gathered in the full of the Moon fall's from the body even of its own weight, for that by reason of the decreasing or wane of the Moon this time of the moneth is more cold and moist. Why old women are purged in the wane of the Moon.

CHAP. L.

The causes of the monethly flux or courses.

BEcaus a woman is more cold, and therefore hath the digestive facultie more weak, it cõmeth to pass, that shee requireth and desireth more meat or food than shee can digest or concoct: And becaus that superfluous humor that remaineth is not digested by exercise, nor by the efficacie of strong and lively heat, therefore by the providence or benefit of nature it floweth out by the veins of the womb, by the power of the expulsive faculty, at its own certain and prefixed season or time. But then especially it beginneth to flow, and a certain crude portion of blood to bee expelled, being hurtfull and malign otherwise in no qualitie, when nature hath laid her principal foundations of the increas of the bodie, so that in greatnes of the bodie, shee hath com as it were in a manner to the highest top, that is to say, from the thirteenth to the fiftieth yeer of our age. The material cause of the monethlie flux. When the monethly flux begin's to flow.

Moreover, the childe cannot bee formed in the womb, nor have his nutriment or encreas without this flux: therefore this is another finall caus of the monethly flux. Manie are perswaded that women do far more abound with blood than men, considering how great an abundance of blood they cast forth of their secret parts everie moneth, from the thirteenth to the fiftieth year of their age: how much women great with childe, of whom also manie are menstruall, yeeld unto the nutriment and encreas of the childe in their wombs, and how much Physicians take from women that are with childe by opening of a vein, which otherwise would bee delivered before their naturall and prefixed time; how great a quantitie thereof they avoid in the birth of their children, and for ten or twelv daies after, and how great a quantitie of milk they spend for the nourishment of the childe when they give suck, which milk is none other thing than blood made white by the power of the kernels that are in the dugs, which doth suffice to nourish the childe, bee hee great or little; yet notwithstanding manie nurses in the mean while are menstrual: and as that may be true, so certainly this is true, that one dram (that I may so speak) of a mans blood, is of more efficacie to nourish and encreas, than two pounds of woman's blood, becaus it is far more perfect, more concocted, wrought, and better replenished with abundance of spirits: whereby it commeth to pass that a man endued with a more strong heat, doth more easily convert wh[illegible] meat soever he eateth unto the nourishment and substance of his bodie; and if that anie superfluitie remain's, he doth easily digest and scatter it by insensible transpiration. But a woman being more cold than a man, becaus shee taketh more than shee can concoct, doth gather together more humors, which becaus shee cannot disperse, by reason of the unperfect- The finall caus. A woman exceed's a man in quantitie of blood. A man exceedeth a woman in the qualitie of his blood. A man is more hot than a woman, and therefore not menstrual.

unperfectneſs and weakneſs of her heat, it is neceſſarie that ſhee ſhould ſuffer, and have her monethly purgation, eſpecially when ſhee groweth unto ſom bigneſs; but there is no ſuch need in a man.

CHAP. LI.

The cauſſes of the ſuppreſſion of the courſes or menſtruall flux.

THe courſes are ſuppreſſed or ſtopped by manie cauſſes, as by ſharp, vehement, and long diſeaſes, by fear, ſorrow, hunger, immoderate labors, watchings, fluxes of the bellie, great bleeding, hæmorrhoids, fluxes of blood at the mouth, and evacuations in anie other part of the bodie whatſoever, often opening of a vein, great ſweats, ulcers flowing much and long, ſcabbineſs of the whole skin, immoderate groſneſs and clammineſs of the blood, and by eating of raw fruits, and drinking of cold water, by ſluggiſhneſs and thickneſs of the veſſels, and alſo the obſtruction of them by the defaults and diſeaſes of the womb, by diſtemperature, an abſceſs, an ulcer, by the obſtruction of the inner orifice thereof, by the growing of a Callus, caruncle, cicatrize of a wound or ulcer, or membrane growing there, by injecting of aſtringent things into the neck of the womb, which place manie women endeavor fooliſhly to make narrow: I ſpeak nothing of age, greatneſs with childe, and nurſing of children, becauſ theſe cauſſes are not beſides nature, neither do they require the help of the Phyſitian.

The fooliſh endeavor of making the orifice of the womb narrow, is rewarded with the diſcommoditie of ſtopping of the flowers.

Manie women, when their flowers or tearms be ſtopped, degenerate after a manner into a certain manly nature, whence they are called *Viragines*, that is to ſay, ſtout, or manly women; therefore their voice is more loud and big, like unto a mans, and they become bearded.

What women are called *Viragines*. *Lib.6.epidem ſect 7.*

In the citie *Abdera* (ſaith *Hippocrates*) *Phaetbuſa* the wife of *Pytheas* at the firſt did bear children and was fruitful, but when her husband was exiled, her flowers were ſtopped for a long time: but when theſe things happened, her bodie became manlike and rough, and had a beard, and her voice was great and ſhrill. The verie ſame thing happened to *Namyſia* the wife of *Gorgippus* in *Thaſus*. Thoſe virgins that from the beginning have not their monethly flux, and yet nevertheleſs enjoy their perfect health, they muſt neceſſarily be hot and drie, or rather of a manly heat and drineſs, that they may ſo diſperſ and diſſipate by tranſpiration, as men do, the excrements that are gathered, but verily all ſuch are barren.

The women that are called *viragines* are barren.

CHAP. LII.

What accidents follow the ſuppreſſion or ſtopping of the monethly flux or flowers.

WHen the flowers or monethly flux are ſtopped, diſeaſes affect the womb, and from thence paſs into all the whole bodie. For thereof commeth ſuffocation of the womb, headach, ſwouning, beating of the heart, and ſwelling of the breaſts and ſecret parts, inflammation of the womb, an abſceſs, ulcer, cancer, a feaver, nauſeouſneſs, vomitings, difficult and ſlow concoction, the dropſie, ſtrangurie, the full womb preſſing upon the orifice of the bladder, black and bloodie urine, by reaſon that portion of the blood ſweateth out into the bladder. In manie women the ſtopped matter of the monethly flux is excluded by vomiting, urine, and the hæmorrhoids, in ſom it groweth into *varices*. In my wife, when ſhee was a maid, the menſtrual matter was excluded and purged by the noſtrils. The wife of *Peter Feure* of *Caſteaudun*, was purged of her menſtrual matter by the dugs everie moneth, and in ſuch abundance, that ſcarce three or four cloaths were able to drie it and ſuck it up.

Why the ſtrangurie, or bloodineſs of the urine followeth the ſuppreſſion of the flowers.

Hiſtories of ſuch as were purged of their menſtrual flux by the noſe and dugs.

In thoſe that have not the flux monethly to evacuate this plenitude by ſom part or place of the bodie, there often follow's difficultie of breathing, melancholie, madneſs, the gout, an ill diſpoſition of the whole bodie, diſſolution of the ſtrength of the whole bodie, want of appetite, a conſumption, the falling ſickneſs, an apoplexie.

Thoſe whoſe blood is laudable, yet not ſo abundant, do receiv no other diſcommoditie by the ſuppreſſion of the flowers, unleſs it be that the womb burn's or itcheth with the deſire of copulation, by reaſon that the womb is diſtended with hot and itching blood, eſpecially if they lead a ſedentary life. Thoſe women that have been accuſtomed to bear children, are not ſo grieved and evil at eaſe when their flowers are ſtopped by anie chance contrarie to nature, as thoſe women which did never conceiv, becauſ they have been uſed to be filled, and the veſſels by reaſon of their cuſtomarie repletion and diſtention, are more large and capacious: when the courſes flow, the appetite is partly dejected, for that nature, beeing then wholly applied to expulſion, cannot throughly concoct or digeſt, the face waxeth pale, and without its lively color, becauſ that the heat with the ſpirits, go from without inwards, ſo to help and aid the expulſive facultie.

To what women the ſuppreſſion of the moneths is moſt grievous.

CHAP.

CHAP. LIII.

Of provoking the flowers or courses.

THe ſuppreſſion of the flowers is a plethorick diſeaſ, and therefore muſt bee cured by evacuation, which muſt bee don by opening the vein called *Saphena*, which is at the ankle, but firſt let the baſilike vein of the arm bee opened, eſpecially if the bodie bee plethorick, leſt that there ſhould a greater attraction bee made into the womb, and by ſuch attraction or flowing in, there ſhould come a greater obſtruction. When the veins of the womb are diſtended with ſo great a ſwelling that they may bee ſeen, it will bee verie profitable to applie horſ-leeches to the neck thereof: peſſaries for women may bee uſed; but fumigations of aromatick things are more meet for maids, becauſ they are baſhfull and ſhamefac'd. Unguents, liniments, emplaſters, cataplaſms, that ſerv for that matter, are to bee preſcribed and applied to the ſecret parts, ligatures and frictions of the thighs and legs are not to bee omitted, fomentations and ſternutatories are to bee uſed, and cupping glaſſes are to bee applied to the groins, walking, dancing, rideing, often and wanton copulation with her husband, and ſuch like exerciſes, provoke the flowers. Of plants, the flowers of St. John's-Wurt, the roots of fennel, and aſparagus, bruſcus or butcher's-broom, of parſleie, brook-lime, baſil, balm, betonie, garlick, onions, criſta marina, coſtmarie, the rinde or bark of caſſia fiſtula, calamint, origanum, penniroyall, mugwort, thyme, hyſſop, ſage, marjoram, roſemarie, horehound, *rue*, ſavin, ſpurge, ſaffron, agarick, the flowers of elder, buie-berries, the berries of Ivie, ſcammonie, *Cantharides*, *pyrethrum* or pellitorie of Spain, *euphorbium*. The aromatick things are *amomum*, cinnamon, ſquinanth, nutmegs, *calamus aromaticus*, *cyperus*, ginger, cloves, galingal, pepper, cubibes, amber, muſk, ſpiknard, and ſuch like; of all which let fomentations, fumigations, baths, broaths, boles, potions, pils, ſyrups, apozemes, and opiates be made as the Phyſicians ſhall think good.

Why the vein called *baſilica* in the arm muſt be opened before the vein *ſaphena* in the foot.

Horſ-leeches to be applied to the neck of the womb.

Plants that provoke the flowers.

Sweet things.

The apozeme that followeth is proved to be verie effectuall. ℞ *fol. & flor. dictam. an.* p ii. *pimpinel.* m ß. *omnium capillar. an.* p i. *artemiſ. thymi, major. origan. an.* m ß. *rad. rub. major. petroſelin. fenicul. an.* ℥ i ß. *rad. pæon. biſtort. an.* ℥ ß. *cicerum rub. ſem. pæon. fenicul. an.* ℥ ß. make thereof a decoction in a ſufficient quantitie of water, adding thereto cinnamon ℥ iii. in one pint of the decoction diſſolve (after it is ſtrained) of the ſyrup of mugwort, and of hyſſop, *an.* ℥ ii. *diarrhod. abbat.* ℥ i. let it be ſtrained through a bag, with ℥ ii. of the kernels of Dates, and let her take ℥ iiii. in the morning.

An apozeme to provoke the flowers.

Let peſſaries bee made with *galbanum*, *ammoniacum*, and ſuch like mollifying things, beaten into a maſs in a mortar with a hot peſtel, and made into the form of a peſſarie, and then let them bee mixed with oil of Jaſmine, *euphorbium*, an ox-gall, the juice of mugwurt, and other ſuch like, wherein there is power to provoke the flowers, as with ſcammonie in powder: let them be as big as ones thumb, ſix fingers long, and rowled in lawn, or ſom ſuch like thin linnen cloth; of the ſame things nodula's may bee made. Alſo peſſaries may bee prepared with honie boiled, adding thereto convenient powders, as of ſcammonie, pellitorie, and ſuch like. Neither ought theſe to ſtaie long in the neck of the womb, leſt they ſhould exulcerate, and they muſt be pulled back by a thread that muſt bee put through them, and then the oriſice of the womb muſt bee fomented with white wine of the decoction of penniroyall or mother-wort.

But it is to be noted, that if the ſuppreſſion of the flowers happeneth through the default of the ſtopped oriſice of the womb, or by inflammation, theſe maladies muſt firſt bee cured before we come unto thoſe things that of their proper ſtrength and virtue provoke the flowers: as for example, if ſuch things bee made and given when the womb is inflamed, the blood beeing drawn into the grieved place, and the humors ſharp'ned, and the bodie of the womb heated, the inflammation will bee increaſed. So if there bee anie ſuperfluous fleſh, if there bee anie Callus of a wound or ulcer, or if there bee anie membrane ſhutting the oriſice of the womb, and ſo ſtopping the flux of the flowers, they muſt firſt bee conſumed and taken away before anie of thoſe things bee adminiſtred. But the opportunitie of taking and applying of things, muſt bee taken from the time wherein the ſick woman was wont to bee purged before the ſtopping, or if ſhee never had the flowers, in the decreaſ of the Moon; for ſo wee ſhall have cuſtom, nature, and the external efficient cauſe to help art. When theſe medicines are uſed, the women are not to be put into baths or hot houſes, as manie do, except the maladie proceed from the denſitie of the veſſels, and the groſneſs and clamminеſs of the blood. For ſweats hinder the menſtrual flux, by diverting and turning the matter another waie.

What cauſſes of the ſtopping of the flowers muſt be cured before the diſeaſ ſelf.

The fitteſt time to provoke the flowers.

Why hot houſes do hurt thoſe in whom the flowers are to be provoked.

CHAP. LIIII.

The ſigns of the approaching of the menſtrual flux.

WHen the monthlie flux firſt approacheth, the dugs itch and become more ſwoln and hard then they were wont, the woman is more deſirous of copulation, by reaſon of the

What women do love and what women do loath the act of generation when the months are ſtopped.

the ebullition of the provoked blood, and the acrimonie of the blood that remaineth, her voice becommeth bigger, her ſecret parts itch, burn, ſwell, and wax red. If they ſtaie long, ſhee hath pain in her loins and head, nauſeouſneſs and vomiting troubleth the ſtomach: notwithſtanding, if thoſe matters which flow together in the womb, either of their own nature, or by corruption, bee cold, they loath the act of generation, by reaſon that the womb waxeth feeble through ſluggiſhneſs and waterie humors filling the ſame, and it floweth by the ſecret parts verie ſoftly. Thoſe maids that are marriageable, although they have the menſtrual flux verie well, yet they are troubled with headach, nauſeouſneſs, and often vomiting, want of appetite, longing, an ill habite of bodie, difficultie of breathing, trembling of the heart, ſwouning, melancholie, fearfull dreams, watching, with ſadneſs and heavineſs, becauſ that the genital parts burning and itching, they imagine the act of generation, whereby it commeth to paſs that the ſeminal matter, either remaining in the teſticles in great abundance, or elſ powred into the hollowneſs of the womb, by the tickling of the genitals, is corrupted, and acquireth a venemous qualitie, and cauſeth ſuch like accidents as happen's in the ſuffocation of the womb.

With what accidents thoſe that are marriageable and are not married, are troubled.

The cauſ of ſo manie accidents.

Maids that live in the countrie are not ſo troubled with thoſe diſeaſes, becauſ there is no ſuch lying in wait for their maiden-heads, and alſo they live ſparingly and hardly, and ſpend their time in continual labor. You may ſee manie maids ſo full of juice, that it runneth in great abundance, as if they were not menſtrual, into their dugs, and is there converted into milk, which they have in as great quantitie as nurſes, as we read it recorded by *Hippocrates*. If a woman which is neither great with childe, nor hath born children, hath milk, ſhee wants the menſtrual fluxes; whereby you may underſtand that that concluſion is not good which affirmeth that a woman which hath milk in her breaſts, either to be delivered of childe, or to be great with childe: for *Cardanus* writeth that hee knew one *Antonie Euzzus* at *Genua*, who beeing thirtie years of age, had ſo much milk in his breaſts as was ſufficient to nurſ a childe; for the breeding and efficient cauſe of milk proceed's not onely from the engrafted facultie of the glandulous ſubſtance, but much rather from the action of the man's ſeed; for proof whereof you may ſee manie men that have verie much milk in their breaſts, and manie women that almoſt have no milk, unleſs they receiv man's ſeed. Alſo women that are ſtrong and luſtie like unto men, which the Latines call *Viragines*, that is to ſay, whoſe ſeed commeth unto a manly nature, when the flowers are ſtopped, concoct the blood, and therefore when it wanteth paſſage forth, by the likeneſs of the ſubſtance it is drawn into the dugs, and becommeth perfect milk: thoſe that have the flowers plentifully and continually for the ſpace of four or five daies, are better purged and with more happie ſucceſs then thoſe that have them for a longer time.

Aph.36.ſect.5.

Lib. 2.de ſubt.

The efficient cauſ of the milk is to be noted.

CHAP. LV.

What accidents follow immoderate fluxes of the flowers or courſes.

IF the menſtrual flux floweth immoderately, there alſo follow's manie accidents; for the concoction is fruſtrated, the appetite overthrow'n, then follow's coldneſs throughout all the bodie, exolution of all the faculties, an ill habit of all the bodie, leanneſs, the dropſie, an hectick fever, convulſion, ſwouning, and often ſudden death: if anie have them too exceeding immoderatly, the blood is ſharp and burning, and alſo ſtinking, the ſick woman is alſo troubled with a continual fever, and her tongue will bee drie, ulcers ariſe in the gums and all the whole mouth. In women the flowers do flow by the veins and arteries which riſe out of the ſpermatick veſſels, and ended in the bottom and ſides of the womb, but in virgins and in women great with childe, whoſe children are ſound and healthful, by the branches of the hypogaſtrick vein and arterie, which are ſpred and diſperſed over the neck of the womb. The cauſ of this immoderate flux is in the quantitie or qualitie of the blood, in both the fault is unreaſonable copulation, eſpecially with a man that hath a yard of a monſtrous greatneſs, and the diſſolution of the retentive facultie of the veſſels: oftentimes alſo the flowers flow immoderately by reaſon of a painful and a difficult birth of the childe or the after-birth, beeing pulled by violence from the cotyledons of the womb, or by reaſon that the veins and arteries of the neck of the womb are torn by the comming forth of the infant with great travel, and manie times by the uſe of ſharp medicines, and exulcerating peſſaries. Oft-times alſo nature avoids all the juice of the whole bodie critically by the womb after a great diſeaſ, which flux is not raſhly or ſuddenly to be ſtopped. That menſtrual blood that floweth from the womb is more groſs, black, and clottie, but that which commeth from the neck of the womb is more clear, liquid and red.

By what ports the flowers do flow in a woman and in a maid.

The cauſſes of an unreaſonable flux of blood.

The critical flux of the flowers.

The ſigns of blood flowing from the womb or neck of the womb.

CHAP. LVI.

Of ſtopping the immoderate flowing of the flowers or courſes.

YOu muſt make choice of ſuch meats and drinks as have power to incraſſate the blood; for as the flowers are provoked with meats that are hot, and of ſubtil parts, ſo they are ſtopped by ſuch meats as are cooling, thickning, aſtringent, and ſtiptick, as are barlie-waters, ſodden rice, the extreme parts of beaſts, as of oxen, calvs, ſheep, either fried or ſodden with ſorrel, purſlain, plantain, ſhepherp's-purſ, ſumach, the buds of brambles, berberries, and ſuch like. It is ſuppoſed that a Hart's-horn burned, waſhed, and taken in aſtringent water, will ſtop all immoderate fluxes; likewiſe *ſanguis draconis, terra ſigillata, bolus armenus, lapis hæmatites*, coral beaten into moſt ſubtil powder, and drunk in ſteeled water; alſo pap made with milk, wherein ſteel hath oftentimes been quenched, and the flowr of wheat, barlie, beans, or rice, is verie effectual for the ſame. Quinces, cervices, medlars, cornelian-berries, or cherries may likewiſe bee eaten at the ſecond courſ, Julips are to bee uſed of ſteeled waters, with the ſyrup of drie roſes, pomegranats, ſorrel, myrtles, quinces, or old *conſervs* of red roſes, but wine is to bee avoided: but if the ſtrength bee ſo extenuated, that they require it, you muſt chuſe groſs and aſtringent wine tempered with ſteeled water; exerciſes are to bee ſhunned, eſpecially venereous exerciſes, anger is to bee avoided, a cold air is to bee choſen, which (if it bee not ſo naturally) muſt bee made ſo by ſprinkling cold things on the ground, eſpecially if the ſummer or heat bee then in his full ſtrength; ſound ſleeping ſtaie's all evacuations, except ſweating. The opening of a vein in the arm, cupping-glaſſes faſtened on the breaſts, bands, and painful frictions of the upper parts are greatly commended in this maladie. The inſtitution or order of life.

But if you perceiv that the cauſ of this accident lieth in a cholerick ill juice mixed with the blood, the bodie muſt bee purged with medicines that purge choler and water, as Rubarb, Myrobalanes, Tamarinds, Sebeſtens, and the purgeing ſyrup of Roſes. Purgeing.

CHAP. LVII.

Of local medicines to bee uſed againſt the immoderate flowing of the Courſes.

ALſo unguents are made to ſtay the immoderate flux of the terms, and likewiſe injections and peſſaries. This or ſuch like may bee the form of an unguent. R. *ol. maſtich. & myrt. an.* ʒii. *nucum cupreſ. olibani, myrtil. an.* ʒii. *ſucci roſar. rubr.* ʒi. *pulv. maſtichin.* ʒii. *boli armen. terræ ſigillat. an.* ʒſ. *ceræ quantum ſufficit, fiat unguentum.* An unguent. An injection may bee thus made. R. *aq. plantag. roſar. rubr. burſæ paſtor. centinodii, an.* lbſ. *corticis querni, nucum cupreſſi, gallar. non maturar. an.* ʒii. *berberis, ſumach. balauſt. alumin. roch. an.* ʒi. make thereof a decoction, and inject it in a ſyringe blunt-pointed into the womb, leſt if it ſhould bee ſharp, it might hurt the ſides of the neck of the womb; alſo Snails beaten with their ſhells, and applied to the navel, are verie profitable. Quinces roſted under the coles, and incorporated with the powder of Myrtles, and *Bole-Armenick*, and put into the neck of the womb, are marvellous effectual for this matter. The form of a peſſarie may bee thus. R. *gallar. immaturar. combuſt. & in aceto extinctar.* ʒii. *ammo.* ʒſ. *ſang. dracon. pulv. rad. ſymphyt. ſumach maſtich. ſucci acaciæ, cornu ceruſt. colophon, myrrhæ, ſcoriæ ferri, an.* ʒi. *caphur.* ʒii. mix them, and incorporate them all together with the juice of knot-graſs, ſyngreen, night-ſhade, hen-bane, water-lillies, plantain, of each as much as is ſufficient, and make thereof a peſſarie. An aſtringent injection. Aſtringent peſſaries.

Cooling things, as Oxycrate, *unguentum roſatum*, and ſuch like, are with great profit uſed to the region of the loins, thighs, and genital parts: but if this immoderate flux do com by eroſion, ſo that the matter thereof continually exulcerateth the neck of the womb; let the place bee annointed with the milk of a ſhee-Aſs, with barlie-water, or bindeing and aſtringent mucelages, as of *Pſilion*, Quinces, Gum Tragacanth, Arabick, and ſuch like.

CHAP. LVIII.

Of Women's Fluxes, or the Whites.

BEſides the fore-named Flux, which by the law of nature happeneth to women monthly, there is alſo another called a *Woman's Flux*, becauſ it is onely proper and peculiar to them: this ſomtimes wearieth the woman with a long and continual diſtillation from the womb, or through the womb, comming from the whole bodie without pain, no otherwiſe then when the whole ſuperfluous filth of the bodie is purged by the reins or urine; ſomtimes it returneth at uncertain ſeaſons, and ſomtimes with pain and exulcerateing the places of the womb: it differeth from the menſtrual Flux, becauſ that this for the ſpace of a few daies, as it ſhall ſeem convenient to nature, caſteth forth laudable blood; but this *Woman's Flux* yeeldeth impure ill juice, The reaſon of the name. The differences.

somtimes sanious, somtimes serous and livid, otherwhiles white and thick, like unto barlie-cream, proceeding from flegmatick blood: this last kinde thereof is most frequent. Therefore wee see women that are flegmatick, and of a soft and loos habit of bodie, to bee often troubled with this diseas; and therefore they will say among themselvs that they have the whites. And as the matter is divers, so it will stain their smocks with a different color. Truely, if it bee perfectly red and sanguine, it is to bee thought it commeth by erosion, or the exsolution of the substance of the vessels of the womb, or of the neck thereof: therefore it commeth verie seldom of blood, and not at all except the woman bee either great with childe, or ceas to bee menstrual for som other caus; for then in stead of the monethly flux there floweth a certain whayish excrement, which staineth her cloaths with the color of water wherein flesh is washed.

What women are apt to this flux.

Women's flux commeth verie seldom of blood.

Also it verie seldom proceed's of a melancholick humor, and then for the most part it causseth a cancer in the womb. But often-times the purulent and bloodie matter of an ulcer lying hidden in the womb, deceiveth the unskilful Chirurgian or Physician: but it is not so hard to know these diseases one from the other; for the matter that floweth from an ulcer, becaus (as it is said) it is purulent, it is also lesser, grosser, stinking, and more white. But those that have ulcers in those places, especially in the neck of the womb, cannot have copulation with a man without pain.

By what signs an ulcer in the womb may bee known from the white flowers.

CHAP. LIX.

Of the causses of the Whites.

Somtimes the caus of the Whites consisteth in the proper weakness of the womb, or elsin the uncleanness thereof; and somtimes by the default of the principal parts. For if the brain or the stomach bee cooled, or the liver stopped or schirrous, manie crudities are engendered, which if they run, or fall down into the womb that is weak by nature, they caus the Flux of the womb, or Whites: but if this Flux bee moderate, and not sharp, it keepeth the bodie from malign diseases; otherwise it useth to infer a consumption, leanness, paleness, and an œdematous swelling of the legs, the falling down of the womb, the dejection of the appetite and all the faculties, and continual sadness and sorrowfulness; from which it is verie hard to perswade the sick woman, because that her minde and heart will bee almost broken, by reason of the shame that shee taketh, becaus such filth floweth continually; it hindereth conception, becaus it either corrupteth, or driveth out the seed when it is conceived. Often-times, if it stoppeth for a few months, the matter that staieth there causseth an abscess about the womb in the bodie or neck thereof; and by the breaking of the abscess there followeth rotten and cancerous ulcers, somtimes in the womb, somtimes in the groin, and often in the hips.

How a woman's flux is wholsom. How it caussеth diseases.

How it letteth the conception.

This diseas is hard to bee cured, not onely by reason of it self, as becaus all the whole filth and superfluous excrements of a woman's bodie floweth down into the womb, as it were into a sink; becaus it is naturally weak, hath an inferior situation, manie vessels ending therein; and last of all, becaus the courses are wont to com through it; as also by reason of the sick woman, who often-times had rather die then to have that place seen, the diseas known, or permit local medicines to bee applied thereto: for so saith *Montanus*, that on a time hee was called to a noble woman of *Italie*, who was troubled with this diseas, unto whom hee gave counsel to have cleansing decoctions injected into her womb, which when shee heard, shee fell into a swound, and desired her husband never thereafter to use his counsel in anie thing.

Why it is hard to bee cured.

An historie.

CHAP. LX.

The cure of the Whites.

If the matter that floweth out in this diseas bee of a red color, it differeth from the natural monthly flux in this onely, becaus it keep's no order or certain time in its returning. Therefore phlebotomie and other remedies which wee have spoken of, as requisite for the menstrual flux, when it floweth immoderately, is here necessarie to bee used. But if it bee white, or doth testifie or argue the ill juice of this or that humor by anie other color, a purgation must bee prescribed of such things as are proper to the humors that offend's: for it is not good to stop such a flux suddenly; for it is necessarie, that so the bodie should bee purged of such filth or abundance of humors: for they that do hasten to stop it, caus the dropsie, by reason that this sink of humors is turned back into the liver; or elsa cancer in the womb, becaus it is staied there, or a fever, or other diseases, according to the condition of the part that receiveth it. Therfore wee must not com to local deterstives, deiccatives, restrictives, unless wee have first used universal remedies according to art. Alum-baths, baths of brimstone, and of bitumen, or iron, are convenient for

If the flux of a woman bee red, wherein it differeth from the menstrual flux.

A woman's flux is not suddenly to bee stopped.

What baths are profitable.

for the whites that com of a phlegmatick humor; inſtead whereof baths may bee made of the decoction of herbs that are hot, drie, and indued with an aromatick power, with alom and pebbls, or flint-ſtones red hot thrown into the ſame. Let this bee the form of a cleanſing decoction and injection. R. *ſol. abſynth. agrimon. centinod. burſ-paſt. an.* m ß. boil them together, and make thereof a decoction, in which diſſolv *mellis-roſar.* ℥ ii. *aloes, myrrhæ, ſalis nitri, an.* ʒi. make thereof an injection, the woman beeing ſo placed on a pillow under her buttocks that the neck of the womb beeing more high, may bee wide open: when the injection is received, let the woman ſet her legs acroſs, and draw them up to her buttocks, and ſo ſhee may keep that which is injected. They that indeavor to drie and binde more ſtrongly, add the juice of *acatia*, green gals, the rindes of pomegranates, roch-alome, romane vitriol, and they boil them in Smiths-water and red-wine; peſſaries may bee made of the like faculties.

What baths are profitable.

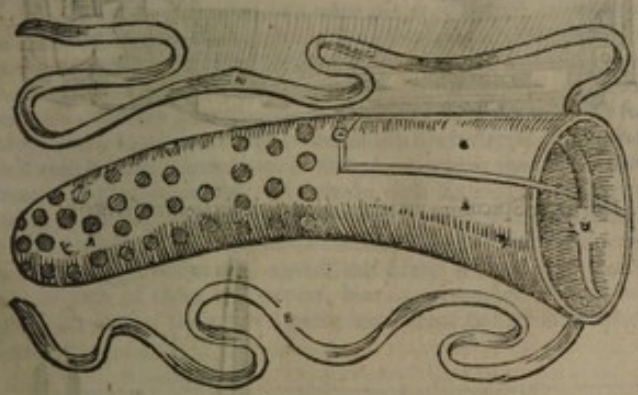
An aſtringent injection.

If the matter that commeth forth bee of an ill color or ſmell, it is like that there is a rotten ulcer; therefore wee ought to inject thoſe things that have power to correct the putrefaction: among which *ægyptiacum*, diſſolved in lie or red-wine, excelleth. There are women which when they are troubled with a virulent *Gonorrhæa*, or an involuntarie flux of the ſeed, cloaking the fault with an honeſt name, do untruly ſay that they have the whites, becauſ that in both theſe diſeaſes a great abundance of filth is avoided. But the Chyrurgian may eaſily perceiv that maladie by the rottenneſs of the matter that floweth out, and hee ſhall perſwade himſelf that it will not bee cured without ſalivation or fluxing at the mouth, and ſweats. In the mean while let him put in an inſtrument made like unto a peſſarie, and cauſ the ſick woman to hold it there: this inſtrument muſt have manie holes in the upper end, through which the purulent matter may paſs, which by ſtaying or ſtopping might get a ſharpneſs; as alſo that ſo the womb may breath the more freely, and may bee kept more temperate and cool by receiving the air, by the benefit of a ſpring whereby this inſtrument, beeing made like unto a peſſarie, is opened and ſhut.

The ſigns of a putrefied ulcer in the womb.

The virulent *Gonorrhæa* is like unto the flux of women.

The form of an Inſtrument made like unto a Peſſarie, whereby the womb may bee ventilated.



A. *Sheweth the end of the Inſtrument, which muſt have manie holes therein.*

B. *Sheweth the bodie of the Inſtrument.*

C. *Sheweth the plate whereby the mouth of the Inſtrument is opened and ſhut, as wide and as cloſe as you will, for to receiv the air more freely.*

D. *Sheweth the ſpring.*

EE. *Shew the laces and bands to tie about the patient's bodie, that ſo the Inſtrument may bee ſtaied and kept faſt in his place.*

CHAP. LXI.

Of the Hæmorrhoides *and Warts of the neck of the womb.*

Like as in the fundament, ſo in the neck of the womb, there are *Hæmorrhoides*, and as it were varicous veins, often-times flowing with much blood, or with a red and ſtinking whayiſh humor. Som of theſe, by reaſon of their redneſs and great inequalitie as it were of knobs, are like unripe Mulberries, and are called vulgarly *venæ morales*, that is to ſay, the veins or *hæmorrhoides* like unto Mulberries: others are like unto Grapes, and therefore are named *uvales*; other ſom are like unto warts, and therefore are called *venæ verrucales*: ſom appear and ſhew themſelvs with a great tumor, others are little, and in the bottom of the neck of the womb; others are in the ſide or edg thereof. *Acbrocordon* is a kinde of wart with a callous bunch or knot, haveing a thin or ſlender root, and a greater head, like unto the knot of a rope, hanging by a ſmall thred; it is called of the Arabians, *verruca botoralis*.

The differences of the *Hæmorrhoides* of the neck of the womb.

What an *Acrochordon* is.

There is alſo another kinde of wart, which becauſ of his great roughneſs and inequalitie, is called *thymus*, as reſembling the flower of Thyme. All ſuch diſeaſes are exaſperated and made more grievous by anie exerciſe, eſpecially by venereous acts: manie times they

What a *Thymus* is.

have a certain malignitie, and an hidden virulencie joined with them, by occasion whereof they are aggravated even by touching onely; becaus they have their matter of a rageing humor: therefore to these wee may not rightly use a true, but onely the palliative cure, as they term it: the Latines call them onely *ficus*, but the French men name them with an adjunct, Saint *Fiacrius* figs.

S. *Fiacrius* figs.

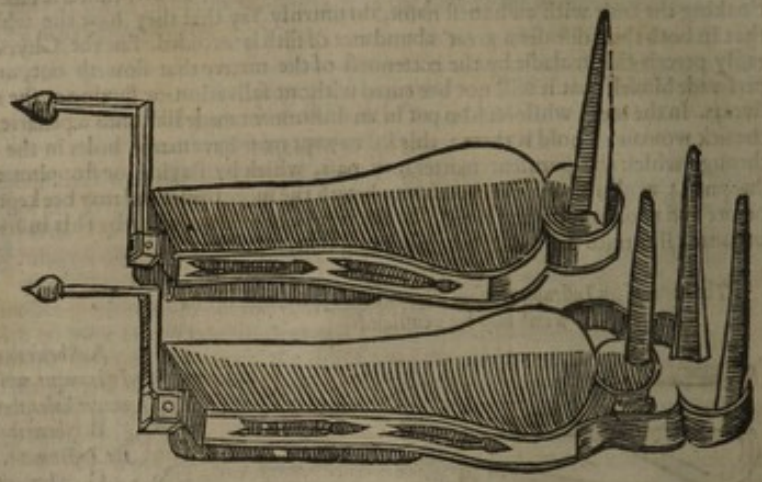
CHAP. LXII.

Of the cure of the Warts that are in the neck of the womb.

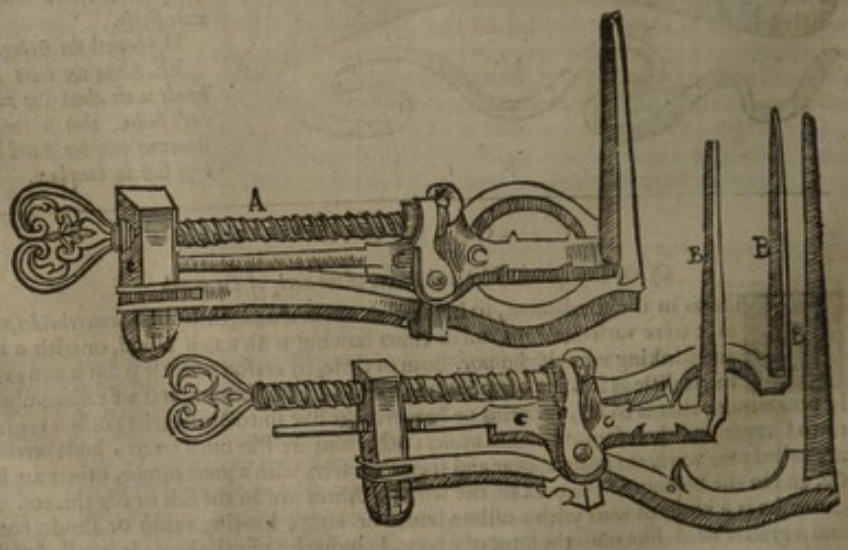
What warts of the womb must bee bound, and so cut off.

THe warts that grow in the neck of the womb, if they bee not malignant, are to bee tied with a thred, and so cut off. Those that lie hid more deep in the womb, may bee seen and cured by opening the *matrix* with a Dilater made for the purpose.

Divers Specula matricis, *or Dilaters for the inspection of the* Matrix.



Another form of a Dilater, or Speculum matricis, *whereof the declaration followeth.*



A. *Sheweth the screw, which shutteth and openeth the Dilater of the* Matrix.
BB. *Shew the arms or branches of the Instrument, which ought to bee eight or nine fingers long.*

But

But theſe Dilaters of the matrix ought to bee of a bigneſs, correſpondent to the patient's bodie; let them bee put into the matrix, when the woman is placed as wee have ſaid, when the childe is to bee drawn out of her bodie. That inſtrument is moſt meet to tie the warts, which wee have deſcribed in the relaxation of the palate or *Vvula*: let them bee tied harder and harder everie day until they fall away. Therefore for the cureing of warts there are three chief ſcopes, as bands, ſections, cauteries; and leſt they grow up again, let oil of vitriol bee dropped on the place, or *aqua fortis*, or ſom of the lee whereof potential cauteries are made. This water following is moſt effectual to conſume and waſte warts. R. *aq. plantag.* ℥vi. *virid. æris*, ʒii. *alum. roch.* ʒiii. *ſal com.* ℥ß. *vit. rom & ſublim. an.* ʒß. beat them all together, and boil them; let one or two drops of this water bee dropped on the grieved place, not touching anie place elſ; but if there bee an ulcer, it muſt bee cured as I have ſhewed before. A certain man, ſtudious of phyſick, of late affirmed to mee, that Ox-dung tempered with the leavs or powder of Savine, would waſte the warts of the womb, if it were applied thereto warm; which, whether it bee true or not, let Experience, the miſtreſs of things, bee judg. Verily, *Cantharides* put into unguents will do it, and (as it is likely) more effectually; for they will conſume the callouſneſs which groweth between the toes or fingers. I have prooved by experience, that the warts that grow on the hands, may bee cured by applying of Purſlain beaten or ſtamp't in its own juice. The leavs and flowers of Marigolds do certainly perform the ſelf-ſame thing.

Three ſcopes of the cure of warts in the womb.

An effectual water to conſume warts.

Unguents to conſume warts.

CHAP. LXIII.

Of Chaps, and thoſe wrinkled and hard excreſcences, which the Greeks call Condylomata.

CHaps or Fiſſures, are cleft and verie long little Ulcers, with pain verie ſharp and burning, by reaſon of the biteing of an acrid, ſalt and drying humor, makeing ſo great a contraction, and often-times narrowneſs in the fundament and the neck of the womb, that ſcarcely the top of one's finger may bee put into the orifice thereof, like unto pieces of leather or parchment, which are wrinkled and parched by holding of them to the fire. They riſe ſomtimes in the mouth, ſo that the patient can neither ſpeak, eat, nor open his mouth, ſo that the Surgeon is conſtrained to cut it. In the cure thereof, all ſharp things are to bee avoided, and thoſe which mollifie are to bee uſed, and the grieved place or part is to bee moiſtened with fomentations, liniments, cataplaſms, emplaſters; and if the maladie bee in the womb, a dilater of the matrix or peſſarie muſt bee put thereinto verie often, ſo to widen that which is over hard, and too much drawn together or narrow, and then the cleft little ulcers muſt bee cicatrized. *Condylomata* are certain wrinkled and hard bunches, and as it were excreſcences of the fleſh, riſeing eſpecially in the wrinkled edges of the fundament and neck of the womb. Cooling and relaxing medicines ought to bee uſed againſt this diſeaſ, ſuch as are oil of eggs, and oil of lin-ſeed, take of each of them two ounces, beat them together a long time in a leaden mortar, and therewith anoint the grieved part; but if there bee an inflammation, put thereto a little Camphir.

What Chaps are.

The cure.

What *Condylomata* are.

The cure.

CHAP. LXIV.

Of the itching of the womb.

IN women, eſpecially ſuch as are old, there often-times commeth an itching in the neck of the womb, which doth ſo trouble them with pain, and a deſire to ſcratch, that it taketh away their ſleep. Not long ſince a woman asked my counſel, that was ſo troubled with this kinde of maladie, that ſhee was conſtrained to extinguiſh or ſtay the itching burning of her ſecret parts by ſprinkling cinders of fire, and rubbing them hard on the place. I counſelled her to take *egypt.* diſſolved in ſea-water or lee, and inject it in her ſecret parts with a ſyringe, and to wet *ſtupes* of flax in the ſame medicine, and put them up into the womb, and ſo ſhee was cured. Manie times this itch commeth in the fundament or teſticles of aged men, by reaſon of the gathering together or conflux of ſalt flegm, which when it falleth into the eies, it cauſſeth the patient to have much ado to refrain ſcratching: when this matter hath diſperſed into the whole habit of the bodie, it cauſſeth a burning or itching ſcab, which muſt bee cured by a cooling and a moiſtning diet, by phlebotomie and purgeing of the ſalt humor, by baths and horns applied, with ſcarification and annointing of the whole bodie with the unction following. R. *axung. porcin. recent.* ℔iiß. *ſap. nig. vel gallici, ſalis nitri, aſſat. tartar. ſtaphiſag. an.* ℥ß. *ſulph. viv.* ʒi. *argent. viv.* ʒii. *acet. roſ. quart.* i. incorporate them all together, and make thereof a liniment according to art, and uſe it as is ſaid before: *unguentum enulatum cum mercurio* is thought to have great force, not without deſert, to aſſwage the

What the itch of the womb

A hiſtorie.

The cauſ of the itch.

The virtue of *unguent. enulat.*

the itch, and drie the ſcab. Som uſe this that followeth. R. *alum. ſpun. nitr. ſulph. viv. an.* ℥vi. *ſtaphiſ.* ℥i. let them all bee diſſolved in vinegar of Roſes, adding thereto *butyr. recent. q. ſ.* make thereof a liniment for the fore-named uſe.

CHAP. LXV.

Of the relaxation of the great Gut, or Inteſtine, which happeneth to women.

The cauſ. Manie women that have had great travel and ſtrains in childe-birth, have the great Inteſtine (called of the Latines *craſſum inteſtinum*) or Gut, relaxed and ſlipped down; which kinde of affect happeneth much to children, by reaſon of a phlegmatick humor moiſtening the *ſphincter*-muſcle of the fundament, and the two others called *Levatores*. For the cure thereof, firſt of all the Gut called *rectum inteſtinum*, or the ſtraight Gut, is to bee fomented with a decoction of heating and reſolving herbs, as of Sage, Roſemarie, Lavander, Thyme, and ſuch like; and then of aſtringent things, as of Roſes, Myrtils, the rindes of Pomegranats, Cypreſs-nuts, Galls, with a little Alum, then it muſt bee ſprinkled with the powder of things that are aſtringent without biteing: and laſt of all, it is to bee reſtored, and gently put into its place. That is ſuppoſed to bee an effectual and ſingular remedie for this purpoſe, which is made of twelv red Snails put into a pot with ℥ß. of Alum, and as much of Salt, and ſhaken up and down a long time, for ſo at length when they are dead there will remain an humor, which muſt bee put upon Cotton, and applied to the Gut that is faln down. By the ſame cauſ (that is to ſay, of painful childe-birth in ſom women) there ariſeth a great ſwelling in the navel; for when the *peritonæum* is relaxed or broken, ſomtimes the Kall, and ſomtimes the Guts ſlip out: manie times flatulencies com thither: the cauſ, as I now ſhewed, is over great ſtraining or ſtretching of the bellie, by a great burthen carried in the womb, and great travel in childe-birth: if the faln-down Guts make that tumor, pain joined together with that tumor doth vex the patient; and if it bee preſſed, you may hear the noiſ of the Guts going back again: if it bee the Kall, then the tumor is ſoft, and almoſt without pain; neither can you hear anie noiſ by compreſſion: if it bee winde, the tumor is looſ and ſoft, yet it is ſuch as will yeeld to the preſſing of the finger with ſom ſound, and will ſoon return again: if the tumor bee great, it cannot bee cured, unleſs the *peritonæum* bee cut, as it is ſaid in the cure of ruptures. In the Church-porches of *Paris*, I have ſeen Beggar-women, who by the falling down of the Guts, have had ſuch tumors as big as a bowl, who notwithſtanding could go, and do all other things as if they had been ſound, and in perfect health: I think it was, becauſ the *fæces* or excrements, by reaſon of the greatneſs of the tumor, and the bigneſs or wideneſs of the Inteſtines, had a free paſſage in and out.

The cure.

An effectual remedie.

The differences and ſigns.

An hiſtorie.

CHAP. LXVI.

Of the relaxation of the navel in children.

Often-times in children newly born, the navel ſwelleth as big as an egg, becauſ it hath not been well cut or bound, or becauſ the whayiſh humors are flowed thither, or becauſ that part hath extended it ſelf too much by crying, by reaſon of the pains of the fretting of the childe's guts, manie times the childe bringeth that tumor joined with an abſceſs with him from his mother's womb: but let not the Chirurgian aſſay to open that abſceſs, for if it bee opened, the guts com out through the inciſion, as I have ſeen in manie, and eſpecially in a childe of my Lord *Martigues*; for when *Peter* of the Rock, the Chirurgian, opened an abſceſs that was in it, the bowels ran out at the inciſion, and the infant died; and it wanted but little that the Gentlemen of my Lord's retinue that were there, had ſtrangled the Chirurgian. Therefore when *Iohn Gromontius* the Carver deſired mee, and requeſted mee of late that I would do the like in his ſon, I refuſed to do it, becauſ it was in danger of its life by it alreadie, and in three daies after the abſceſs broke, and the bowels guſhed out, and the childe died.

An abſceſs not to bee opened.

An hiſtorie.

CHAP. IX.

Of the pain that children have in breeding of teeth.

The time of breeding of the teeth. Children are greatly vexed with their teeth, which cauſ great pain when they begin to break, as it were, out of their ſhell or ſheath, and begin to com forth, the gums beeing broken, which for the moſt part happeneth about the ſeventh month of the childe's age. This pain commeth with itching and ſcratching of the gums, an inflammation, flux of the bellie, whereof manie times commeth a fever, falling of the hair, a convulſion, at length death. The cauſ of the pain

pain is the ſolution of the continuitie of the gums by the comming forth of the teeth. The ſignes of that pain is an unaccuſtomed burning, or heat of the childe's mouth, which may bee perceived by the nurſ that giveth it ſuck, a ſwelling of the gums and cheeks, and the childe's beeing more way-ward and crying then it was wont, and it will put its fingers to its mouth, and it will rub them on its gums as though it were about to ſcratch, and it ſlavereth much. That the Phyſician may remedie this, hee muſt cure the nurſ as if ſhee had the fever, and ſhee muſt not ſuffer the childe to ſuck ſo often, but make him cool and moiſt when hee thirſteth by giving him at certain times *ſyrupus alexandrinus*, *ſyrup. de limonibus*, or the ſyrup of pomegranats with boiled water; yet the childe muſt not hold thoſe things that are actually cold long in his mouth, for ſuch by bindeing the gums, do in ſom ſort ſtay the teeeth that are newly comming forth; but things that lenifie and mollifie are rather to bee uſed, that is to ſay, ſuch things as do by little and little relax the looſ fleſh of the gums, and alſo aſſwage the pain. Therefore the Nurſ ſhall often-times rub the childe's gums with her fingers, annointed or beſmeared with oil of ſweet al monds, freſh-butter, honie, ſugar, mucilage of the ſeeds of *pſilium*, or of the ſeeds of marſh-mallows extracted in the water of pellitorie of the wall. Som think that the brain of a hare, or of a ſucking pig roſted or ſodden, through a ſecret propertie, are effectual for the ſame: and on the outſide ſhall bee applied a cataplaſm of barlie-meal, milk, oil of roſes, and the yelks of egs. Alſo a ſtick of liquorice ſhaven and bruiſed and annointed with honie, or anie of the forenamed ſyrups, and often rubbed in the mouth or on the gums, is likewiſe profitable: ſo is alſo anie toie for the childe to plaie withall, wherein a wolve's tooth is ſet, for this by ſcratching doth aſſwage the painfull itching, and rarifie the gums, and in ſom weareth them that the teeth appear the ſooner. But manie times it happeneth that all theſe and ſuch like medicines profit nothing at all, by reaſon of the contumacie of the gums, by hardneſs or the weakneſs of the childe's nature: therefore in ſuch a cauſ, before the fore-named mortal accidents com, I would perſwade the Chirurgian to open the gums in ſuch places as the teeth bunch out with a little ſwelling, with a knife or lancet, ſo breaking and opening a wate for them, notwithſtanding that a little flux of blood will follow by the tenſion of the gums: of which kinde of remedie I have with proſperous and happie ſucceſs made trial in ſom of mine own children, in the preſence of *Feureus*, *Altinus*, and *Cortinus*, Doctors of Phyſick, and *Guillemeau* the King's Chirurgian, which is much better and more ſafe then to do as ſom nurſes do, who taught onely by the inſtinct of nature, with their nails and ſcratching, break and tear, or rent the children's gums. The Duke of *Nevers* had a ſon of eight months old, which died of late, and when wee, with the Phyſicians that were preſent, dili gently ſought for the cauſ of his death, wee could impute it unto nothing elſ, then to the contumacious hardneſs of the gums, which was greater then was convenient for a childe of that age; for therefore the teeth could not break forth, nor make a paſſage for themſelvs to com forth: of which our judgment this was the trial, that when wee cut his gums with a knife, wee found all his teeth appearing as it were in an arraie, readie to com forth, which if it had been don wh en hee lived, doubtleſs hee might have been preſerved.

The cauſ of the pain in breeding teeth.

The ſigns.

The cure.

What power ſcratching of the gums hath to aſſwage the pain of them.

An hiſtorie.

The end of the twentie fourth Book.

Of *Monsters* and *Prodigies*.

The twentie fifth Book.

THE PREFACE.

What a Monster is.

What a Prodigie is.

WE call Monsters, what things soever are brought forth contrarie to the common decree and order of nature. So wee term that infant monstrous, which is born with one arm alone, or with two heads. But wee define Prodigies, those things which happen contrarie to the whole course of nature, that is, altogether differing and dissenting from nature: as if a woman should bee delivered of a Snake, or a Dog. Of the first sort are thought all those, in which anie of those things, which ought, and are accustomed to bee, according to nature, is wanting, or doth abound, is changed, worn, covered or defended, hurt, or not put in his right place: for somtimes som are born with more fingers then they should, other som but with one finger: som with those parts divided which should bee joined, others with those parts joined which should bee divided: som are born with the privities of both sexes, male and female. And Aristotle saw a Goat with a horn upon her knee. No liveing creature was ever born which wanted the Heart, but som have been seen wanting the Spleen, others with two Spleens, and som wanting one of the Reins. And none have bin known to have wanted the whole Liver, although som have been found that had it not perfect and whole: and there have been those which wanted the Gall, when by nature they should have had it: and besides it hath been seen that the Liver, contrarie to his natural site, hath lien on the left side, and the Spleen on the right. Som women also have had their privities closed, and not perforated, the membranous obstacle, which they call the Hymen, hindering. And men are somtimes born with their fundaments, ears, noses, and the rest of the passages shut, and are accounted monstrous, nature erring from its extended scope. But to conclude, those Monsters are thought to portend som ill, which are much differing from their nature.

Lib. 4. gen. anim. cap. 4.

CHAP. I.

Of the caus of Monsters; and first of those Monsters which appear for the glorie of God, and the punishment of mens wickedness.

THere ape reckoned up manie causes of Monsters, the first whereof is the glorie of God, that his immens power may bee manifested to those which are ignorant of it, by the sending of those things which happen contrarie to nature: for thus our *Savior* Christ answered the *Disciples* (asking whether hee or his *parents* had offended, who beeing *born blinde*, received his sight from him) that neither *hee* nor his *parents* had committed anie fault so great, but this to happened onely that the *glorie* and majestie of God should bee divulged by that miracle, and such great works.

Another caus is, that God may either punish men's wickedness, or shew signs of punishment at hand, becaus parents somtimes lie and join themselvs together without law and measure, or luxuriously and beastly, or at such times as they ought to forbear by the command of God and the Church, such monstrous, horrid and unnatural births do happen.

The figure of a Colt with a man's face.

At *Verona Anno Dom.* 1254. a mare foaled a colt with the perfect face of a man, but all the rest of the bodie like an horse: a little after that, the war between the *Florentines* and *Pisans* began, by which all *Italie* was in a combustion.

About

The figure of a winged Monster.

About the time that Pope *Julius* the second raised up all *Italie*, and the greatest part of Christendom, against *Lewis* the twelfth the King of *France*, in the year of of our Lord 1512. (in which year, upon Easter daie, near *Ravenna* was fought that mortal battel, in which the Pope's forces were overthrown) a monster was born in *Ravenna*, haveing a horn upon the crown of his head, and besides, two wings, and one foot alone, most like to the feet of birds of prey, and in the knee thereof an eie, the privities of male and female, the rest of the bodie like a man, as you may see by this figure.

The third cauſ is, an abundance of seed and overflowing matter. The fourth, the same in too little quantitie, and deficient. The fift, the force and efficacie of imagination. The sixt, the straightness of the womb. The seventh, the disorderly site of the partie with childe, and the position of the parts of the bodie. The eight, a fall, strain or stroak, especially upon the bellie of a woman with childe. The ninth, hereditarie diseases, or affects by anie other accident. The tenth, the confusion and mingling together of the seed. The eleventh, the craft and wickedness of the divel. There are som others which are accounted for monsters, becauſ their original or essence full of admiration, or do assume a certain prodigious form by the craft of som begging companions; therefore wee will speak briefly of them in their place in this our treatise of monsters.

CHAP. II.

Of Monsters cauſed by too great abundance of seed.

Seeing wee have already handled the two former and truly final cauſes of monsters, wee must now com to those which are material, corporeal and efficient cauſes, takeing our beginning from that wee call the too great abundance of the matter of seed. It is the opinion of those Philosophers which have written of monsters, that if at anie time a creature bearing one at once, as man, shall cast forth more seed in copulation then is necessarie to the generation of one bodie, it cannot bee that onely one should bee begot of all that; therefore from thence either two or more must arise: whereby it commeth to pass, that these are rather judged wonders, becauſ they happen seldom, and contrarie to common custom. Superfluous parts happen by the same cauſ, that twins and manie at one birth, contrarie to nature's cours, do chance, that is, by a larger effusion of seed then is required for the frameing of that part, that so it exceed's either in number or elſ in greatness. So *Austin* tell's that in his time in the East an infant was born, haveing all the parts from the bellie upwards double, but from thence downwards single and simple: for it had two heads, four eies, two breasts, four hands, in all the rest like to another childe, and it lived a little while. *Cælius Rhodiginus* saith hee saw two monsters in *Italie*, the one male, the other female, handsomly and neatly made through all their bodies, except their heads, which were double; the male died within a few daies after it was born; but the female (whose shape is here delineated) lived twenty-five years, which is contrarie to the common custom of monsters; for they for the most part are verie short-liv'd, becauſ they both live and are born, as it were, against nature's consent; to which may bee added, they do not love themselvs, by reason they are made a scorn to others, and by that means lead a hated life.

Monsters are seldom long-lived.

The

But it is most remarkable which *Lycosthenes* telleth of a * Woman-monster, for, excepting her two heads, shee was framed in the rest of her bodie to an exact perfection: her two heads had the like desire to eat and drink, to sleep, to speak, and to do everie thing; shee begged from door to door, everie one giveing to her freely. Yet at length shee was banish't *Bavaria*, lest that by the frequent looking upon her, the imagination of women with childe, strongly mooved, should make the like impression in the infants they bare in their wombs.

*The effigies of a * Maid with two heads.*

The effigies of two » Girls whose backs grew together.

In the year of our Lord 1475. at *Verona* in *Italie*, two » Girls were born with their backs sticking together from the lower part of the shoulders unto the verie buttocks. The noveltie and strangeness of the thing mooved their parents, beeing but poor, to carrie them through all the chief towns in *Italie* to get monie of all such as came to see them.

The figure of a man with another growing out of him.

In the year 1530. there was a man to bee seen at *Paris*, out of whose bellie another, perfect in all his members except head, hanged forth as if hee had been grafted there. The man was fortie years old, and hee carried the other implanted or growing out of him, in his arms, with such admiration to the beholders, that manie ran verie earnestly to see him.

The

The effigies of a horned or hooded monster.

At *Guiers*, a small village som ten miles from *Turine* in *Savoy*, in the year 1578. upon the seventeenth daie of Januarie, about eight a clock at night, an honest matron brought forth a childe haveing five horns, lik to Ram's horns, set opposite to one another upon his head: hee had also a long peece of flesh, like in som sort to a French-hood which women used to wear, hanging down from his forehead by the nape of his neck almost the length of his back: two other peeces of flesh, like the collar of a shirt, were wrapped about his neck: the finger's ends of both his hands somwhat resembled a Hawk's talons, and his knees seemed to bee in his hanus: the right leg and the right foot were of a verie red color; the rest of the bodie was of a tawnie color: it is said hee gave so terrible a scritch when hee was brought forth, that the Midwives, and the rest of the women that were at her labor, were so frighted that they presently left the hous and ran away. When the Duke of *Savoy* heard of this monster, hee commanded it should bee brought to him, which performed, one would hardly think what various censures the Courtiers gave of it.

The monster you see here delineated, was found in the middle and innermost part of an * Egg, with the face of a man, but hairs yeelding a horrid representation of Snakes; the chin had three other snakes stretched forth like a beard. It was first seen at *Auxur*, at the hous of one *Bancberon* a Lawyer, a maid breaking manie egs to butter: the white of this egg given a Cat, presently killed her. Lastly this monster comming to the hands of the Baron *Senecy*, was brought to King *Charls* the ninth beeing then at *Metz*.

*The shape of a monster found in an * Egg.*

The effigies of a monstrous b Childe, haveing two heads, two arms and four legs.

In the year 1546. a woman at *Paris* in her first month of her account, brought forth a b Childe haveing two heads, two arms and four legs: I, dissecting the bodie of it, found but one heart, by which one may know it was but one infant. For you may know this from *Aristotle*, whether the monstrous birth bee one or more joined together, by the principal part: for if the bodie have but one heart, it is but one; if two, it is double by the joining together in the conception.

In

In the year 1569. a certain woman of *Towers* was delivered of * Twins joined together with one head, and mutually embraceing each other. *Renatus Ciretus* the famous Chirurgian of those parts, sent mee their *Sceleton.*

*The portraiture of * Twins joined together with one head.*

The effigies of two ♀ Girls beeing twins, joined together by their fore-heads.

Munster write's that in the village *Bristant*, not far from *Worms*, in the year 1495. hee saw two ♀ Girls perfect and entire in everie part of their bodies, but they had their foreheads so joined together that they could not bee parted or severed by anie art: they lived together ten years; then the one dying, it was needful to separate the liveing from the dead: but shee did not long out-live her sister, by reason of the malignitie of the wound made in parting them asunder.

In the year of our Lord 1570: the twentieth of Julie, at *Paris*, in the street *Gravilliers*, at the sign of the Bell, these two infants were born, differing in sex, with that shape of bodie that you see here expressed in the figure. They were baptized in the Church of S. *Nicolas* of the fields, and named *Ludovicus* and *Ludovica*, their father was a Mason, his name was *Peter Germane*, his surname *Petit Dieu* (*i.*) little-God, his mother's name was *Mathea Petronilla.*

The shape of the infants lately born at Paris.

In

In the year 1572 in *Pont de See*, near *Angers* a little town, were born upon the tenth daie of Julie, two girls, perfect in their limbs, but that they had but four fingers apiece on their left hands: they clave together in their fore parts, from their chin to their navel, which was but one, as their heart also but one; their liver was divided into four lobes: they lived half an hour, and were baptized.

The figure of two girls joined together in their breasts and bellie.

The figure of a childe with two heads, and the bodie as big as one of four moneths old.

Var. lect. lib. 24 cap. 8.

Cælius Rhodiginus tell's, that in a town of his countrie called *Sarzano*, *Italie* beeing troubled with civil Wars, there was born a monster of unusual bigness; for hee had two heads, having all his limbs answerable in greatness and tallness to a childe of four months old: between his two heads, which were both alike, at the setting on of the shoulder, it had a third hand put forth, which did not exceed the ears in length, for it was not all seen: it was born the 5. of the Ides of *March*, 1514.

The figure of one with four legs and as manie arms.

The figure of a man out of whose bellie another head shewed it self.

Jovianus Pontanus tell's in the year 1529. the ninth daie of Januarie, there was a man childe born in Germanie, haveing four arms, and as many legs.

In the year that *Francis* the first King of *France* entered into league with the *Swisses*, there was born a monster in *Germanie*, out the midst of whose bellie there stood a great head; it came to man's age, and his lower, and as it were inserted head, was nourished as much as the true and upper head.

The shape of two monstrous Twins, beeing but of one onely Sex.

In the year 1572. the last daie of *Februarie*, in the parish of *Vinhan*, in the waie as you go from *Carnuta* to *Paris*, in a small village called *Bordes* one called *Cypriana Giranda*, the wife of *James Merchant* a husbandman, brought forth this monster whose shape you see here delineated, which lived until the Sundaie following, beeing but of one onely sex, which was the female.

The shape of a monstrus Pig.

In the year 1572. on Easter Mundaie at *Metz* in *Lorain*, in the Inn whose sign is the Holie Ghost, a Sow pigged a pig, wch had eight legs, four ears, and the head of a dog; the hinder part from the bellie downward was parted in two as in twins, but the fore-parts grew into one; it had two tongues in the mouth, with four teeth in the upper jaw, and as manie in the lower. The sex was not to bee distinguished, whether it were a Bore or Sow pig, for there was one slit under the tail, and the hinder parts were all rent and open. The shape of this monster, as it is here set down, was sent mee by *Borgesius* the famous Physician of *Metz*.

CHAP. III.

Of women bringing manie Children at one birth.

WOman is a creature bringing usually but one at a birth: but there have been som who who have brought forth two, som three, som four, som five, six, or more at one birth. *Empedocles* thought that the abundance of seed was the caus of such numerous births: the *Stoiks* affirm the diverse cells or partitions of the womb to bee the caus; for the seed beeing variously parted into these partitions, and the conception divided, there are more children brought forth; no otherwise then in rivers, the water beating against the rocks, is turned into divers circles or rounds. But *Aristotle* saith there is no reason to think so, for in women that parting of the womb into celle, as in dogs and sows, taketh no place; for women's wombs have but one cavitie, parted into two recesses, the right and left, nothing comming between, except by chance distinguished by a certaine line; for often twins lie in the same side of the womb. *Aristotle*'s opinion is, that a woman cannot bring forth more then five children at one birth. The maid of *Augustus Cesar* brought forth five at a birth, and, a short while after, she and her children died. In the year 1554. at *Bearn* in *Switzerland*, the wife of Dr. *John Gelenger* brought forth five children at one birth, three boies and two girls. *Albucrasis*, affirm's a woman to have been the mother of seven children at one birth; and another, who by som external injurie did abort, brought forth fifteen perfectly shaped in all their parts. *Plinie* report's that it was extant in the writeings of Physicians, that twelv children were born at one birth; and that there was another in *Peloponnesus* which four several times was delivered of five children at one birth, and that the greater part of those children lived. It is reported by *Dalechampius* that *Bonaventura* the slave of one *Savil*, a gentleman of *Sena*, at one time brought forth seven children, of which four were baptized. In our time, between *Sarte* and *Main*, in the parish of *Seaux*, not far from *Chambellay*, there is a familie and noble hous called *Maldemeure*; the wife of the Lord of *Maldemeure*, the first year shee was married brought forth twins, the second year shee had three children, the third year four, the fourth year five, the fifth year six, and of that birth shee died: of those six one is yet alive, and is Lord of *Maldemeure*. In the valley of *Beaufort*, in the countie of *Anjou*, a young woman the daughter of *Mace Chanviere*, when at one perfect birth shee had brought forth one childe, the tenth daie following shee fell in labor of another, but could not bee delivered untill it was pulled from her by force, and was the death of the mother.

4. *De gen. anim. cap.* 4.

Lib. 7. *cap.* 11. *Cap.* 3.

Martin

The picture of Dorothie, *great with childe with manie children.*

Martin Cromerus the autor of the Poliſh hiſtorie, writeth that one *Margaret*, a woman ſprung from a noble and ancient familie neer *Cracovia*, and wife to Count *Virboſlaus*, brought forth at one birth thirtie five live children, upon the twentieth daie of *Jan.* in the year 1296. *Franciſcus Picus Mirandula* writeth that one *Dorothie* an Italian had twentie children at two births; at the firſt nine, and at the ſecond eleven, and that ſhee was ſo big, that ſhee was forced to bear up her bellie, which laie upon her knees, with a broad and large ſcarf tied about her neck, as you may ſee by this figure. The ninth Book of the Poliſh Hiſtorie.

And they are to bee reprehended here again, who affirm the cauſ of numerous births to conſiſt in the varietie of the cels of the womb, for they feign a woman's womb to have ſeven cels or partitions; three on the right ſide for males, three on the left ſide for females, and one in the mid'ſt for Hermophrodites or Scrats: and this untruth hath gon ſo far, that there have been ſom that affirmed everie of theſe ſeven cels to have been divided into ten partitions, into which the ſeed diſperſed, doth bring forth a divers and numerous encreaſ, according to the varietie of cels furniſhed with the matter of ſeed; which, though it may ſeem to have been the opinion of *Hippocrates*, in his Book *De natura Pueri*, notwithſtanding it is repugnant to reaſon, and to thoſe things which are manifeſtly apparent to the eies and ſenſes.

The opinion of *Ariſtotle* is more probable, who ſaith twins and more at one birth, are begot and brought forth by the ſame cauſ that the ſixth finger groweth on the hand, that is, by the abundant plentie of the ſeed, which is greater and more copious then can bee all taken up in the natural framing of one bodie; for if it all bee forced into one, it maketh one with the parts encreaſed more then is fit, either in greatneſs or number; but if it bee, as it were, cloven into divers parts, it cauſſeth more then one at one birth. *Lib. 4. de gen. anim. cap. 4.*

CHAP. IV.

Of Hermophrodites, or Scrats.

AND here alſo wee muſt ſpeak of Hermophrodites, becauſ they draw the cauſ of their generation and conformation from the abundance of ſeed, and are called ſo, becauſ they are of both ſexes, the woman yeelding as much ſeed as the man. For hereupon it commeth to paſs that the forming facultie (which alwaies endeavor's to produce ſomthing like it ſelf) doth labor both the matters almoſt with equal force, and is the cauſ that one bodie is of both ſexes.

Yet ſom make four differences of Hermophrodites; the firſt of which is the male Hermophrodite, who is a perfect and abſolute male, and hath onely a ſlit in the *Pertinæon* not perforated, and from which neither urine nor ſeed doth flow. The ſecond is the female, which beſides her natural privitie, hath a fleſhie and skinnie ſimilitude of a man's yard, but unapt for erection and ejaculation of ſeed, and wanteth the cod and ſtones; the third difference is of thoſe, which albeit they bear the expreſs figures of members belonging to both ſexes, commonly ſet the one againſt the other, yet are found unapt for generation, the one of them onely ſerving for makeing of water: the fourth difference is of thoſe who are able

able in both ſexes, and throughly perform the part of both man and woman, becauſ they have the genitals of both ſexes complete and perfect, and alſo the right breſt like a man, and the left like a woman: the laws command thoſe to chuſe the ſex which they will uſe, and in which they will remain and live, judging them to death if they bee found to have departed from the ſex they made choice of, for ſom are thought to have abuſed both, and promiſcuouſly to have had their pleaſure with men and women. There are ſigns by which the Phyſicians may diſcern whether the Hermophrodites are able in the male or female ſex, or whether they are impotent in both: theſe ſigns are moſt apparent in the privities and face; for if the matrix bee exact in all it's demenſions, and ſo perforated that it may admit a man's yard, if the courſes flow that waie, if the hair of the head bee long, ſlender and ſoft, and to conclude, if to this tender habite of the bodie a timid and weak condition of the minde bee added, the female ſex is predominant, and they are plainly to bee judged women. But if they have the *Perinæum* and fundament full of hairs, (the which in women are commonly without anie) if they have a yard of a convenient largeneſs, if it ſtand well and readily, and yeeld ſeed, the male ſex hath the preheminence, and they are to bee judged men. But if the conformation of both the genitals bee alike in figure, quantitie, and efficacie, it is thought to bee equally able in both ſexes: although by the opinion of *Ariſtotle*, thoſe who have double genitals, the one of the male, the other of the female, the one of them is alwaies perfect, the other imperfect.

Lib. 4 de gener. anim. cap. 5.

The figure of Hermophrodite twins cleaving together with their backs.

Anno Dom. 1486. In the *Palatinate*, at the village *Robach*, neer *Heidelberg*, there were twins, both Hermophrodites, born with their backs ſticking together.

The effigies of an Hermophrodite haveing four hands and feet.

The ſame day the *Venetians* and *Genoëſes* entred into league, there was a monſter born in *Italie* haveing four arms and feet, and but one head; it lived a little after it was baptized. *James Ruef* a *Helvetian* Chirurgian ſaith hee ſaw the like, but which beſides had the privities of both ſexes, whoſe figure I have therefore ſet forth, *Pag.* 653.

CHAP. V.

Of the changeing of Sex.

AMatus *Luſitanus* report's that in the village *Eſquina*, there was a maid named *Maria Pateca*, who at the appointed age for her courſes to flow, had in ſtead of them a man's yard, laying before that time hid and covered, ſo that of a woman ſhee became a man, and therefore laying aſide her woman's habite, was cloathed in man's, and changeing her name, was called *Emanuël*; who, when hee had got much wealth by manie and great negotiations and commerce in *India*, returned into his countrie, and married a wife: but *Luſitanus* ſaith hee did not certainly know whether hee had anie children, but that hee was certain he remained alwaies beardleſs.

Antonie Loqueneux, the King's keeper or receiver of his rents of St. *Quintain* at *Vermandois*, lately affirmed to mee that hee ſaw a man at *Reimes*, at the Inn haveing the ſign of the Swan, in

in the year 1560. who was taken for a woman untill the fourteenth year of his age; for then it happened as he played somwhat wantonly with a maid which laie in the same bed with him, his members (hitherto lying hid) started forth and unfolded themselvs: which when his parents knew (by help of the Ecclesiastick power) they changed his name from *Joan* to *John*, and put him in man's apparel.

Som years agon, beeing in the train of King *Charls* the Ninth, in the French Glass-hous, I was shewed a man called *Germane Garnierus*, but by som *Germane Maria* (becaus in former times when hee was a woman hee was called *Marie*) hee was of an indifferent stature, and well set bodie, with a thick and red beard; hee was taken for a girl until the fifteenth year of his age, becaus there was no sign of beeing a man seen in his bodie, and for that amongst women, hee in like attire did those things which pertain to women: in the fifteenth year of his age, whilest hee somwhat earnestly pursued hogs given into his charge to bee kept, who running into the corn, hee leaped violently over a ditch, whereby it came to pass that the staies and foldings beeing broken, his hidden members suddenly broke forth, but not without pain; going home, hee weeping complained to his mother that his guts came forth: with which his mother amazed, calling Physicians and Surgeons to counsel, heard hee was turned into a man; therefore the whole businesse beeing brought to the Cardinal the Bishop of *Lenuncure*, an assemblie beeing called, hee received the name and habite of a man.

Plinie report's that the son of *Cassinus* of a girl became a boy, liveing with his parents; but by the command of the Sooth-saiers hee was carried into a desert Isle, becaus they thought such monsters did alwaies shew or portend som monstrous thing. Certainly women have so manie and like parts lying in their womb, as men have hanging forth; onely a strong and livelie heat seem's to bee wanting, which may drive forth that which lie's hid within: therefore in process of time, the heat beeing increased and flourishing, and the humiditie (which is predominant in childe-hood) overcom, it is not impossible that the virile members, which hitherto sluggish by defect of heat, lay hid, may bee put forth; especially if to that strength of the growing heat som vehement concussion or jactation of the bodie bee joined. Therefore I think it manifest by these experiments and reasons, that it is not fabulous that som women have been changed into men: but you shall finde, in no historie men, that have degenerated into women; for nature alwaies intend's and goe's from the imperfect to the more perfect, but not basely from the more perfect to the imperfect.

CHAP. VI.

Of Monsters caused by the defect of Seed.

IF, on the contrarie, the seed bee anie thing deficient in quantitie, for the conformation of the infant or infants, som one or more members will bee wanting, or more short and decrepite. Hereupon it happen's that nature intending twins, a childe is born with two heads, and but one arm, or altogether lame in the rest of his limbs.

The effigies of a monstrous childe, by reason of the defect of the matter of seed.

Anno Dom. 1573. I saw at Saint *Andrew's* Church in *Paris*, a boy nine years old, born in the village *Parpavilla*, six miles from *Guise*; his father's name was *Peter Renard*, and his mother, *Marquete*: hee had but two fingers on his right hand, his arm was well proportioned from the top of his shoulder almost to his wrist, but from thence to his two finger's ends it was verie deformed, hee wanted his legs and thighs, although from the right buttock a certain unperfect figure, haveing onely four toes, seemed to put it self forth; from the midst of the left buttock two toes sprung out, the one of which was not much unlike a man's yard, as you may see by the figure.

In the year 1562 in the Calends of November, at *Villa franca* in *Gasconie*, this monster, a headless woman, whose figure thou here see'st, was born, which figure Dr. *John Altinus* the Physician gave to mee, when I went about this book of Monsters, hee haveing received it from *Fontanus* the Physician of *Angolestre*, who seriously affirmed hee saw it.

The figure of a monstrous woman without a head, before and behinde.

The effigies of a man without arms, doing all that is usually don with hands.

The effigies of a monster with two heads, two legs, and but one arm.

A few years agon there was a man of fortie years old to bee seen at *Paris*, who although hee wanted his arms, notwithstanding did indifferently perform all those things which are usually don with the hands; for with the top of his shoulder, head and neck, hee would strike an Axe or Hatchet with as sure and strong a blow into a post, as anie other man could do with his hand: and hee would lash a Coach-man's whip, that hee would make it give a great crack, by the strong refraction of the air; but hee ate, drank, plai'd at cards, and such

such like, with his feet. But at last hee was taken for a thief and murderer, was hanged, and fastened to a wheel.

Also not long ago there was a woman at *Paris* without arms, which nevertheless did cut, sew, and do many other things, as if shee had her hands.

Wee read in *Hippocrates*, that *Antagenis* his wife brought forth a childe all of flesh without anie bone, and notwithstanding it had all the parts well formed.

CHAP. VII.

Of Monsters, which take their cause and shape by imagination.

THe Antients haveing diligently sought into all the secrets of nature, have marked and observed other causses of the generation of Monsters: for, understanding the force of imagination to bee so powerful in us, as for the most part, it may alter the bodie of them that imagine, they soon perswaded themselvs that the faculties which formeth the infant may bee led and governed by the firm and strong cogitation of the Parents begetting them (often deluded by nocturnal and deceitful apparitions) or by the mother conceiving them; and so that which is strongly conceived in the minde, imprint's the force into the infant conceived in the womb: which thing manie think to bee confirmed by *Moses*, becaus hee tell's that *Jacob* encreased and bettered the part of the sheep granted to him by *Laban*, his wive's father, by putting rods, haveing the bark in part pulled off, finely streaked with white and green, in the places where they used to drink, especially at the time they engendred, that the representation apprehended in the conception, should bee presently impressed in the young; for the force of imagination hath so much power over the infant, that it set's upon it the notes or characters of the thing conceived.

The force of imagination upon the bodie and humors.

Gen. chap. 30.

Wee have read in *Heliodorus*, that *Persina* Queen of *Æthiopia*, by her husband *Hidustes*, beeing also an Ethiope, had a daughter of a white complexion; becaus in the embraces of her husband, by which shee proved with childe, shee earnestly fixed her eie and minde upon the picture of the fair *Andromeda* standing opposite to her. *Damascene* report's, that hee saw a maid hairie like a Bear, which had that deformitie by no other caus or occasion then that her mother earnestly beheld, in the verie instant of receiving and conceiving the seed, the image of S. *John* covered with a Camel's skin, hanging upon the posts of the bed.

They say, *Hippocrates* by this explication of the causses, free'd a certain noble woman from suspition of adulterie, who beeing white her self, and her husband also white, brought forth a childe as black as an Ethiopian, becaus in copulation shee strongly and continually had in her minde the picture of the Ethiope.

The effigies of a maid all hairie, and an infant that was black by the imagination of their Parents.

There

There are som who think the infant once formed in the womb, which is don at the utmost within two and fortie daies after the conception, is in no danger of the mother's imagination, neither of the seed of the father which is cast into the womb; becaus when it hath got a perfect figure, it cannot bee altered with anie external form of things; which whether it bee true, or no, is not here to bee inquired of: truly I think it best to keep the woman, all the time shee goeth with childe, from the sight of such shapes and figures.

In *Stecquer* a village of *Saxonie*, they say, a monster was born, with four feet, eies, mouth, and nose like a calf, with a round and red excrescence of flesh on the forehead, and also a piece of flesh like a hood hung from his neck upon his back, and it was deformed with its thighs torn and cut.

The effigies of a horrid Monster, haveing feet hands and other parts like a Calf.

The figure of an infant with a face like a Frog.

Anno Dom. 1517. in the parish Kingsf-wood, in the forrest *Biera*, in the waie to *Fontain-Bleau*, there was a monster born, with the face of a Frog, beeing seen by *John Bellanger*, Chirurgian to the King's Engineers, before the Justices of the town of *Harmoy*, principally *John Bribon* the King's procurator in that place. The father's name was *Amadeus* the *Little*, his mother's *Magdalene Sarbucata*, who troubled with a fever, by a woman's perswasion, held a quick frog in her hand until it died, shee came thus to bed with her husband and conceived; *Bellanger*, a man of an acute wit, thought this was the cauf of the monstrous deformitie of the childe.

CHA VIII.

Of Monsters caussed by the straitnes of the womb.

That the straitnes or littlenes of the womb may bee the occasion of monsters

WE E are constrained to confes by the event of things, that monsters are bred and caussed by the straitnes of the womb; for so apples growing upon the trees, if before they com to just ripenes, they bee put into strait vessels, their growth is hindred. So som whelps which women take delight in, are hindred from anie further growth by the littlenes of the place in which they are kept. Who know's not that the plants growing in the earth, are hindred from a longer progres and propagation of their roots, by the opposition of a flint, or anie other solid bodie, and therefore in such places are crooked, slender and weak, but on the other part, where they have free nourishment, to bee strait and strong? for seeing that by the opinion of Naturalists, the place is the form of the thing placed; it is necessarie that those things that are shut up in straiter spaces, prohibited of free motion, should be lessened, depraved, and lamed.

Empedocles and *Diphilus* acknowledged three causses of monstrous births: The too great or small matter of the seed; the corruption of the seed; and depravation of growth by the straitnes or figure of the womb: which they thought the chiefest of all; becauf they thought

thought the case was such in natural births, as in forming of metals and fusible things, of which statues beeing made, do less express the things they bee made for, if the molds or forms into which the matter is poured, bee rough, scabrous, too strait, or otherwise faultie.

CHAP. IX.

Of monsters caussed by the ill placeing of the mother, in sitting, lying down, or anie other site of the bodie in the time of her beeing with childe.

WEE often too negligently and careleslly corrupt the benefits and corporal endowments of nature in the comlines and dignitie of conformation: it is a thing to bee lamented and pitied in all, but especially in women with childe, becaus that fault doth not only hurt the mother, but deform's and pervert's the infant which is contained in her womb: for wee mooving anie manner of waie, must necessarily moov whatsoever is within us. Therefore they which sit idlely at home all the time of their beeing with childe, or cross-legged, those which holding their heads down, do sow or work with the needle, or do any other labor, which press the bellie too hard with cloaths, breeches or swathes, do produce children wrie-necked, stooping, crooked, and disfigured in their feet, hands, and the rest of their joints, as you may see in the following figure.

The effigies of a childe, who from the first conception, by the site of the mother, had his hands and feet standing crooked.

CHAP. X.

Of monsters caussed by a stroke, fall, or the like occasion.

THere is no doubt but if anie injurie happen to a woman with childe, by reason of a stroke, fall from on high, or the like occasion, the hurt also may extend to the childe. Therefore by these occasions the tender bones may bee broken, wrested, strained, or depraved after som other monstrous manner; and more, by the like violence of such things, a vein is often opened or broken, or a flux of bloud, or great vomiting is caussed by the vehement concussion of the whole bodie, by which means the childe want's nourishment, and therefore will bee small and little, and altogether monstrous.

CHAP.

CHAP. XI.

Of Monsters which have their original by reason of hereditarie diseases.

BY the injurie of hereditarie diseases, infants grow monstrous, that is, monstrously deformed: for crook't-back't produce crook-back't, and often-times so crooked, that between the bunch behinde and before, the head lie's hid, as a Tortoise in her shell: so lame produce lame, flat-nos'd their like, dwarfs bring forth dwarfs, lean bring forth lean, and fat produce fat.

CHAP. XII.

Of Monsters by the confusion of seed of divers kindes.

THat which followeth is a horrid thing to bee spoken; but the chaste minde of the Reader will give mee pardon, and conceive that, which not onely the Stoicks, but all Philosophers, who are busied about the search of the causses of things, must hold, That there is nothing obscene or filthie to bee spoken. Those things that are accounted obscene may bee spoken without blame, but they cannot bee acted or perpetrated without great wickedness, furie and madness; therefore that ill which in obscuritie consist's not in word, but wholly in the act. Therefore in times past there have been som, who nothing fearing the Deitie, neither the Law, nor themselvs, that is, their soul, have so abjected and prostrated themselvs, that they have thought themselvs nothing different from beasts: wherefore Atheists, Sodomites, Out-laws, forgetful of their own excellencie and divinitie, and transformed by filthie lust, have not doubted to have filthie and abominable copulation with beasts. This so great, so horrid a crime, for whose expiation all the fires in the world are not sufficient, though they too maliciously craftie, have concealed, and the conscious beasts could not utter, yet the generated mis-shapen issue hath abundantly spoken and declared, by the unspeakable power of God, the revenger and punisher of such impious and horrible actions. For of this various and promiscuous confusion of seeds of a different kinde, Monsters have been generated and born, who have been partly men, andpartly beasts.

The like deformitie of issue is produced, if beasts of a different species do copulate together, nature alwaies affecting to generate somthing which may bee like it self: for wheat grow's not but by sowing of wheat, nor an apricock but by the setting or grafting of an apricock; for nature is a most diligent preserver of the species of things.

The effigies of a Monster half man and half dog.

Anno Dom. 1493. there was generated of a woman and a dog, an issue, which from the navel upwards perfectly resembled the shape of the mother, but therehence downwards the fire, that is, the dog. This monster was sent to the Pope that then reigned, as *Volaterane* writeth: also *Cardane* mention's it; wherefore I have given you the figure thereof.

Cardan.lib.14. de var.rerum cap.94.

Celius

The figure of a Monster in face resembling a man, but a Goat in his other members.

Cælius Rhodoginus write's that at *Sibaris*, a heardſ-man called *Cbrathis* fell in love with a Goat, and accompanied with her, and of this deteſtable and brutiſh copulation an infant was born, which in legs reſembled the dam, but the face was like the father's.

The figure of a pig, with the head, face, hands, and feet of a man.

Anno Dom. 1110. In a certain town of *Liege* (as ſaith *Lycoſthenes*) a Sow farrowed a pig with the head, face, hands, and feet of a man, but in the reſt of the bodie reſembling a ſwine.

Anno Dom. 1564. at *Bruxels*, at the houſ of one *Joeſt Dillzpeers*, in the ſtreet *Warmoesbroelis*, a Sow farrowed ſix pigs, the firſt whereof was a monſter repreſenting a man in the head, face, fore-feet and ſhoulders, but in the reſt of the bodie another pig, for it had the genitals of a ſow-pig, and it ſucked like other pigs. But the ſecond daie after it was farrowed, it was killed of the people together with the ſow, by reaſon of the monſtrouſneſs of the thing. Here followeth the figure thereof.

The effigies of a Monſter half man and half ſwine.

An-

Anno Dom. 1571. at *Antwerp*, the wife of one *Michaël* a Printer dwelling with one *John Molline* a Graver or Carver, at the ſign of the Golden Foot, in the *Caniſtrate*, on St. *Thomas* his daie, at ten of the clock in the morning, brought forth a monſter wholly like a dog, but that it had a ſhorter neck, and the head of a bird, but without anie fethers on it. This monſter was not alive, for that the mother was delivered before her time; but ſhee giveing a great ſcritch in the inſtant of her deliverance, the chimnie of the houſ fell down, yet hurt no bodie, no not ſo much as anie one of four little children that ſate by the fire-ſide.

The figure of a monſter like a dog, but with a head like a bird.

Lewis Gellius writeth that hee hath read in an approved autor, that an Ew once brought forth a Lion, a beaſt of an unlike and adverſ nature to her.

Anno Dom. 1577. in the town *Blandie*, three miles from *Melun*, there was lambed a Lamb, haveing three heads, the middlemoſt of which was bigger then the reſt, when one bleated they all bleated. *John Bellanger* the Chirurgian of *Melun* affirmed that hee ſaw this monſter, and hee got it drawn, and ſent the figure thereof to mee with that humane monſter that had the head of a Frog, which wee have formerly deſcribed.

The figure of a three-headed Lamb.

There are ſom monſters in whoſe generation by this there may ſeem to bee ſom divine cauſ, for that their beginnings cannot bee derived or drawn from the general cauſ of monſters, that is, nature, or the errors thereof, by reaſon of ſom of the fore-mentioned particular cauſſes: ſuch are theſe monſters that are wholly again all nature, like that which wee formerly mentioned, of a Lion yeaned by an Ew.

Yet Aſtrologers (leſt there ſhould ſeem to bee anie thing which they are ignorant of) refer the cauſſes of theſe to certain conſtellations and aſpects of the Planets and Stars, according to *Ariſtotle's* ſaying in his Problems; in confirmation whereof they tell us this tale. It happened in the time of *Albertus Magnus*, that in a certain village, a Cow brought forth a Calf, which was half a man: the townſ-men apprehended the heardſ-man, and condemned him as guiltie of ſuch a crime, to bee preſently burnt together with the Cow; but by good luck *Albertus* was there, to whom they gave credit by reaſon of his much and certain experience in Aſtrologie, that it was no occaſioned by anie humane wickedneſs, but by the efficacie of a certain poſition of the ſtars, that this monſter was born.

CHAP.

CHAP. XIII.

Of monsters occasioned by the craft and subtiltie of the Devil.

IN treating of such monsters as are occasioned by the craft of the Devil, wee crave pardon of the courteous Reader, if peradventure going further from our purpose, wee may seem to speak more freely and largely of the existence, nature, & kindes of Devils. Therefore first it is manifest that there are Conjurers, Charmers, and Witches, which whatsoever they do, perform it by an agreement and compact with the Devil, to whom they have addicted themselvs: for none can bee admitted into that societie of Witches, who hath not forsaken God the Creator, and his Saviour, and hath not transferred the worship due to him above, upon the Devil, to whom hee hath obliged himself. And assuredly, whosoever addict's himself to these Magical vanities and witch-crafts, doth it, either becaus hee doubt's of God's power, promises, studie and great good will towards us: or elf for that hee is madded with an earnest desire of knowing things to com; or elf becaus disdaining povertie, hee affect's and desire's from a poor estate to becom rich on the sudden. It is the constant opinion of all, both antient and modern, as well Philosophers as Divines, that there are som such men; which when they have once addicted themselvs to impious and divelish Arts, can by the wondrous craft of the Divel, do manie strange things, and change and corrupt bodies, and the health and life of them, and the condition of all mundane things. Also experience forceth us to confess the same, for punishments are ordained by the laws against the professors and practisers of such Arts; but there are no laws again those things which neither ever have been, nor never came into the knowledg of men: for such things are rightly judged and accounted for impossibilities, which have never been seen nor heard of.

There are forcerers, and how they com so to bee.

What induceth them thereto.

Before the birth of Christ there have been manie such people, for you may finde in *Exodus* and *Leviticus* laws made against such persons by *Moses*, by whom God gave the Law to his people. The Lord gave the sentence of death to *Ochawas* by his Prophet, for that hee turned into these kinde of people. Wee are taught by the Scriptures that there are good and evil spirits, and that the former are termed Angels, but the later Devils; for the law is also said to bee given by the ministrie of Angels: and it is said that our bodies shall rise again at the sound of a trumpet, and the voice of an Arch-angel. Christ said that God would send his Angels to receiv the Elect into the heavens.

Exod. cap. 22.
Levit. cap. 19.
Hebr. 1. 14.
Gal. 3. 19.
1 Thes. 4. 16.

The historie of *Job* testifieth ehat the Devil sent fire from heaven, and killed his sheep and cattel, and raised windes that shook the four corners of the hous, and overwhelmed his children in the ruines thereof. The historie of *Achab* mentioneth a certain lying spirit in the mouth of the falf Prophets. Sathan entring into *Judas*, moved him to betraie Christ. Devils, who in a great number possessed the bodie of a man, were called and obtained of Christ that they might enter into Swine, whom they carried headlong into the Sea.

Job. 13.
Mat. 26. 34.

In the beginning God created a great number of Angels, that those divine and incorporeal spirits might inhabit heaven, and as messengers, signifie God's pleasure to men, and as ministers or servants, perform his commands, who might bee as over-seers & protectors of humane affairs. Yet of this great number there were som who were blinded by pride, and thereby also cast down from the presence, and heavenlie habitation of God the Creator. These harmful and craftie spirits delude men's mindes by divers jugling tricks, and are alwaies contriving somthing to our harm, and would in a short space destroie mankinde, but that God restrain's their furie; for they can onely do so much as is permitted them: Expelled heaven, som of them inhabit the air; others, the bowels of the earth; there to remain until God shall com to judg the world: and as you see the clouds in the air somwhiles to resemble centaures, otherwhiles serpents, rocks, towers, men, birds, fishes, and other shapes: so these spirits turn themselvs into all the shapes and wondrous forms of things; as oft-times into wilde-beasts, into serpents, toads, owls, lapwings, crows or ravens, goats, asses, dogs, cats, wolvs, buls, and the like. Moreover, they oft-times assume and enter humane bodies, as well dead as alive, whom they torment and punish, yea also they transform themselvs into angels of light.

The power of evil spirits over mankinde.

The differences of devils.

They feign themselvs to bee shut up and forced by Magical rings, but that is onely their deceit and craft, they wish, fear, love, hate, and oft-times as by the appointment and decree of God they punish malefactors: for wee read that God sent evil angels into Egypt, there to destroie. They houl on the night, they murmure and rattle, as if they were bound in chains, they move benches, tables, counters, props, cupboards, children in the cradles, plaie at tables and chess, turn over books, tell monie, walk up and down rooms and are heard to laugh, to open windows and doores, cast sounding vessels, as brass and the like, upon the ground, break stone-pots & glasses, & make other the like noises. Yet none of all these things appear to us when as we arise in the morning, neither find we anie thing out of its place or broken.

The delusions of devils.

Their titles and names.

They are called by divers names, as Devils, evil Spirits, *Incubi*, *Succubi*, Hobgoblins, Fairies, Robin-good-fellows, evil-Angels, Sathan, Luciter, the father of lies, Prince of darkness and of the world, Legion, and other names agreeable to their offices and natures.

CHAP. XIV.

Of the subterrene Devils, and such as haunt Mines.

What the Devils in Mines do.

LEwis Lavater write's, that by the certain report of such as work in Mines, that in som Mines there are seen spirits, who in the shape and habit of men, work there, and running up and down seem to do much work, when as notwithstanding they do nothing indeed. But in the mean time they hurt none of the by-standers, unless they bee provoked thereto by words, or slaughter. For then they will throw som heavie or hard thing upon him that hurt them, or injure them som other waie.

The same autor affirm's that there is a silver Mine in *Rhetia*, out of which *Peter Briot*, the Governor of the place, did in his time get much silver. In this Mine there was a Devil, who chiefly on Fridaie, when as the Miners put the Mineral they had digged into tubs, kept a great quarter, and made himself exceeding busie, and poured the Mineral as hee listed, out of one tub into another. It happened one daie that hee was more busie then it used to bee, so that one of the Miners reviled him, and bad him bee gone on a vengeance to the punishment appointed for him. The Devil offended with his imprecation and scoff, so wrested the Miner, takeing him by the head, twineing his neck about, hee set his face behinde him, yet was not the workman killed therewith, but lived, and was known by divers for manie years after.

CHAP. XV.

By what means the Devils may deceiv us.

Devils are spirits, and from eternitie.

OUr mindes involved in the earthie habitation of our bodies, may bee deluded by the Devils divers waies: for they excel in puritie and subtiltie of essence, and in the much use of things: besides, they challenge a great preheminence, as the Princes of this world, over all sublunarie bodies. Wherefore is is no marvel if they, the teachers and parents of lies, should cast clouds and mists before our eies from the beginning, and turn themselvs into a thousand shapes of things and bodies, that by these juglings and tricks they may shadow and darken men's mindes.

CHAP. XVI.

Of Sucubi *and* Incubi.

The reason of the name. *Lib. 15. de civit. Dei, cap. 22. & 23.*

POwerful by these fore-mentioned arts and deceits, they have sundrie times accompanied with men in copulation, whereupon such as have had to do with men were called *Sucubi*, those which made use of women, *Incubi*. Verily St. *Augustine* seemeth not to bee altogether against it, but that they, takeing upon them the shape of man, may fill the genitals, as by the help of nature, to the end that by this means they may draw aside the unwarie, by the flames of lust, from virtue and chastitie.

An historie.

John Ruef in his book of the conception and generation of man, write's that in his time, a certain woman of monstrous lust, and wondrous impudencie, had to do by night with a Divel, that turned himself into a man, and that her bellie swelled up presently after the act; and when as shee thought shee was with childe, shee fell into so grievous a disease, that shee voided all her entrails by stool, medicines nothing at all prevailing.

Another.

The like historie is told of the servant of a certain Butcher, who thinking too attentively on venereous matters, a Devil appeared to him in the shape of a woman, with whom (supposing it to bee a woman) when as hee had to do, his genitals so burned after the act, that becomming enflamed hee died with a great deal of torment.

An opinion confuted.

Neither doth *Peter Paludanus*, and *Martin Arelatensis* think it absurd to affirm that Devils may beget children, if they shall ejaculate into the woman's womb seed taken from som man either dead or alive. Yet this opinion is most absurd and full of falsitie, man's seed consisting of a seminal or sanguineous matter, and much spirit: if it run otherwaies then into the womb from the testicles, and staie never so little a while, it loseth it strength and efficacie, the heat and spirits vanishing away; for even the too great length of a man's yard, is reckoned amongst the causses of barrenness, by reason that the seed is cooled by the length of the waie. If anie in copulation, after the ejaculation of the seed, presently draw themselvs from the woman's embraces, they are thought not to generate, by reason of the air entring into

into the yet open womb, which is thought to corrupt the seed. By which it appear's how falſ that hiſtorie in *Averrois* is, of a certain woman that ſaid ſtee conceived with childe by a man's ſeed ſhed in a bath, and ſo drawn into her womb, ſhee entring the bath preſently after his departure forth. It is much leſs credible that Divels can copulate with women, for they are of an abſolute ſpirituous nature, but bloud and fleſh are neceſſarie for the generation of man. What natural reaſon can allow that the incorporeal Devils can love corporeal women? And how can wee think that they can generate, who want the inſtruments of generation? How can they who neither eat nor drink bee ſaid to ſwel with ſeed? Now where the propagation of the ſpecies is not neceſſarie to bee ſupplied by the ſucceſſion of individuals, Nature hath given no deſire of venerie, neither hath it imparted the uſe of generation; but the devils once created were made immortal by God's appointment: If the facultie of generation ſhould bee granted to devils, long ſince all places had been full of them. Wherefore if at anie time women with childe by the familliaritie of the devil, ſeem to travel, we muſt think it happen's by thoſe arts wee mentioned in the former chapter, to wit, they uſe to ſtuff up the bodies of living women with old clouts, bones, pieces of iron, thorns, twiſted hairs, pieces of wood, ſerpents, and a world of ſuch trumperie, wholly diſſenting from a womans nature: who afterwards, the time, as it were, of their deliverie drawing nigh, through the womb of her that was falſly judged with childe, before the blinded, and, as it were, bound up eies of the by-ſtanding women, they give vent to their impoſtures. The following hiſtorie, recorded in the writings of manie moſt credible authors, may give credit hereto.

Averrois his hiſtorie convict of falſhood.

The illuſions of the devils.

There was at *Conſtance* a fair damoſel called *Margaret*, who ſerved a wealthie Citizen: ſhee gave it out everie where that ſhee was with childe by lying with the devil on a certain night. Wherefore the Magiſtrates thought it fit ſhee ſhould bee kept in priſon, that it might bee apparent both to them and others, what the end of this exploit would bee. The time of deliverance approching, ſhee felt pains like thoſe which women endure in travel; at length, after manie throws, by the midwive's help, in ſtead of a childe, ſhee brought forth iron nails, pieces of wood, of glaſs, bones, ſtones, hairs, tow, and the like things, as much different from each other, as from the nature of her that brought them forth, and which were formerly thruſt in by the devil to delude the too credulous minds of men.

A hiſtorie.

The Church acknowledgeth that devils, by the permiſſion and appointment of God puniſhing our wickedneſs, may abuſe a certain ſhape, ſo to uſe copulation with mankinde. But that an humane birth may thence ariſe, it not onely affirm's to bee falſ, but deteſt's as impious, as which believ's that there was never anie man begot without the ſeed of man, our Saviour Chriſt excepted. Now what confuſion and perturbation of creatures ſhould poſſeſs this world (as *Caſtianus* ſaith) if devils could conceiv by copulation with men? or if women ſhould proov with childe by accompanying them, how manie monſters would the devils have brought forth from the beginning of the world? how manie prodigies by caſting their ſeed into the wombs of wilde and bruit beaſts? for by the opinion of Philoſophers, as often as facultie and will concur, the effect muſt neceſſarily follow: now the devils never have wanted will to diſturb mankinde, and the order of this world: for the devil, as they ſay, is our enemie from the beginning; and as God is the autor of order, and beautie, ſo the devil, by pride, contrarie to God, is the cauſſer of confuſion and wickedneſs.

Our ſins are the cauſ that the devils abuſe us.

Wherefore if power ſhould accrew equall to his evil minde and nature, and his infinite deſire of miſchief and envie, who can doubt but a great confuſion of all things and ſpecies, and alſo great deformitie would invade the decent and comlie order of this univerſ, monſters ariſeing on everie ſide: But ſeeing that devils are incorporeal, what reaſon can induce us to believ that they can bee delighted with venereous actions: and what will can there bee where as there is no delight, nor anie decaie of the ſpecies to bee feared? ſeeing that by God's appointment they are immortal, ſo to remain for ever in puniſhment: ſo what need they ſucceſſion of individuals by generation? wherefore if they neither will nor can, it is a madneſs to think that they do commix with man.

CHAP. XVII.

Of Magick and ſupernatural diſeaſes and remedies.

THat I may refreſh the minde of the Reader, invited to theſe hiſtories of monſters raiſed up by the art of the devil, witches, and conjurers, his ſervants, I have thought good to add the following hiſtorie of certain diſeaſes, and remedies ſupernatural, and vvholly magical out of *Fernelius*. There are diſeaſes, vvhich as they are ſent amongſt men by God beeing offended, ſo they cannot expect cure othervviſe then from God, from vvhence they are thought ſupernaturally to have their eſſence and cure. Thus the air oft-times, yet chiefly in the time of King *David*, being defiled vvith the peſtilence, killed ſixtie odd thouſand perſons.

Lib. 2. de abdit. cauſ. cap. 16.

Thus *Ezechias* was ſtruck vvith a grievous diſeaſ: *Job* vvas defiled vvith filthie ulcers by Sathan at God's command. And as the Devil, the cruel enemie of mankinde, commonly uſeth

Witches hurt by the devil's assistance.

useth by God's permission to afflict those, so wicked persons by the wondrous subtiltie of the devil, offer violence and do harm to manie. Som invoke I know not what spirits, and adjure them with herbs, exorcisms, imprecations, incantations, charms: others hang about their necks, or otherwise carry certain writings, characters, rings, images, and other such impious stuff. Som use songs, sounds or numbers: somtimes potions, perfumes, and smels; somtimes gestures and jugling. There bee som that make the portraiture of the absent partie in wax, and boast that they can cause or bring a disease into what soever part thereof they prick, by the force of their words and stars, into the like part of the partie absent; and they have no few other tricks to bring diseases.

We know for certain that magicians, witches, and conjurers, have by charms so bound som, that they could not have to do with their wives; and have made others so impotent, as if they had been gelt or made eunuchs. Neither do wicked men onely send diseases into man's bodie, but also devils themselvs. These truely are soon distracted with a certain furie, but in this one thing they differ from simple madnes, for that they speak things of great difficultie, tell things past and hid, disclose the secrets of such as are present, and revile them manie waies, and are terrified, tremble and grow angrie by the power of divine words.

A historie.

One not very long agon, beeing by reason of heat exceeding drie in the night time, riseing out of his sleep, and not findeing drink, took an apple that hee found by chance, and eating it, hee thought his jaws were shut and held fast as by ones hands, and that hee was almost strangled: and also, now possessed of a devil entring into him, hee seemed in the dark to bee devoured of a huge exceeding black dog, which hee, afterwards restored to his former health, orderly related to mee. There were divers, who by his pulse, heat and the roughnes of his tongue, thought him to bee in a fever, and by his watching, and the perturbation of his minde, thought him onely to rave.

A historie.

Another young Noble man, som few years since, was troubled at set times with a shaking of the bodie, and as it were, a convulsion, wherewith one while hee would moov onely his left arm, another while the right arm, and also som times but one finger onely, somwhiles but one leg, somtimes the other, and at other times the whole trunk of his bodie, with such force and agilitie, that lying in his bed, hee could scarce bee held by four men; his head laie without anie shakeing, his tongue and speech was free, his understanding sound, and all his senses perfect even in the height of his fit. Hee was taken at the least ten times a daie, well in the spaces between, but wearied with labor: it might have been judged a true Epilepsie, if the understanding and senses had failed.

The most judicious Physitians who were called to him, judged it a convulsion, cosen-germane to the falling sickness, proceeding from a malign and venemous vapor impact in the spine of the back, whence a vapor dispersed it self over all the nervs, which pass from the spine every waie into the limbs, but not into the brain. To remoov this, which they judged the cause, frequent glysters are ordained, and strong purges of all sorts, cupping-glasses are applied to the beginnings of the nervs, fomentations, unctions, emplasters, first to discuss, then to strengthen and wear awaie the malign qualitie: These things doing little good, hee was sweated with bathes, stoves, and a decoction of *Guajacum*, which did no more good then the former, for that wee were all far from the knowledg of the true cause of his disease: for in the third month, a certain devil was found to bee the autor of all this ill, bewraying himself by voice, and unaccustomed words and sentences, as well Latin as Greek (though the patient were ignorant of the Greek tongue): hee laied open manie secrets of the by-standers, and chiefly of the Physicians, derideing them for that hee had abused them to the patients great harm, becaus they had brought his bodie so low by needless purgations.

The devil shew's himself by speaking of greek.

When his father came to visit him, hee would crie out long before hee came at him, or saw him, drive away this visitant, and keep him from coming in here, or else pluck his chain from about his neck: for on this (as it is the custom of the French order of Knights) there hangs the image of St. *Michael*. If holie and divine things were read before him, hee shook and trembled more violently. When his fit was over, hee remembred all that was don, and affirmed that hee did it against his will, and that hee was forrie for it. The devil, forced by ceremonies and exorcisms, denied that hee was damned for anie crime, and said that hee was a spirit: beeing asked who hee was, and by what means and power hee did these things, hee said that hee had manie habitations into which hee could betake himself, and in the time of his rest, hee could torment others: that hee was cast into this bodie by a certain person whom hee would not name, and that hee entred by his feet up to his neck, and that hee would go forth again the same waie, when as his appointed time was com. Hee spoke of sundrie other things, as others which are possessed use to do.

Devils wax angrie, and are terrified by divine things.

Now I speak not these things as new or strange, but that it may appear that devils somtimes entring into the bodie, do somwhiles torment it by diverse and uncough waies; other whiles they do not enter in, but either agitate the good humors of the bodie, or draw the ill into the principal parts, or with them obstruct the veins or other passages, or chang the structure of the instruments, from which causes innumerable diseases, proceed: of these, devils

vils are the autors, and wretched and forlorn persons the ministers: and the reason of these things is beyond the search of nature.

Plinie tel's that the Emperor *Nero* in his time, found magical arts most vain and falſ: but what need wee alledg profane writers, when as those things that are recorded in Scripture of the pithoniſs, of the woman speaking in her bellie, of King *Nebuchodonozor*, of the Magitians of *Pharaoh*, and other such things not a few, proov that there both is, and hath been Magick. *Plinie* tel's of *Denarchus*, that hee tasteing of the entrails of a sacrificed childe, turned himself into a Wolf. Wee reade in *Homer* that *Circes*, in the long wandring of *Ulysses*, changed his companions into beasts, with an inchanted cup or potion: and in *Virgil*, that the growing corn may bee spoiled or carried away by inchantments: which things, unless they were approoved and witnessed by manie men's credits, the wisdom of Magistrates and Lawyers, would not have made so manie Laws against Magicians, neither would there have been a mulct impoſed upon their heads by the law of the twelv tables, who had inchanted other men's corn. But as in magical arts the devil doth not exhibit things themselvs, as those which hee cannot make, but onely certain shews or appearances of things: so in these which are anie waies accomodated to the use of Physick, the cure is neither certain, nor safe, but deceitful, captious, and dangerous.

I have seen the Jaundiſ, over the whole bodie, cured in one night, by a written scroul hanged about the neck: also I have seen Agues chased away by words and such ceremonies, but in a short while after they returned again and became much worſ. Now there are som vain things, and verily the fancies of old women, which becauſ they have long possessed the mindes of men, weakned with too much superstition, we term them superstitious. These are such as wee cannot truly say of them, wherefore and whence they have the faculties ascribed to them: for they neither arise from the temperament, neither from the other manifest qualities, neither from the whole substance, neither from a divine or magical power, from which two last mentioned, all medicines beyond nature, and which are consequently to bee used to diseases, whose essence are supernatural, must proceed. Such like old wive's medicines & superstitions remedies are written figures and characters, rings, where neither the assistance of God or Spirits is implored. Let me ask you, is it not a superstitious medicine to heal the falling sickness, to carrie in writing the names of the three Kings, *Gaspar*, *Melchior*, and *Balthasar*, who came to worship Christ? To help the tooth ache; if one whil'st Mass is in saying, touch his teeth, saying these words, *Os non comminuetis ex eo*? To staie vomiting with certain ceremonies and words, which they absent pronounce, thinking it sufficient if that they but onely know the patient's name.

It is but a deceitful cure that is performed by the devil.

Old wive's superstitious medicines against divers diseases

I saw a certain fellow that with murmuring a few words, and touching the part, would stanch bloud out of what part soever it flowed: there bee som who to that purpose saie this, *De latere ejus exivit Sanguis & Aqua*. How manie praiers or charms are carried about to cure agues? som takeing hold of the patient's hand, saie, *Æquè facilis tibi Febris hæc sit, atque Mariæ virgini Christi partus*. Another washeth his hands with the patient before the fit, saying to himself that solemn Psalm, *Exaltabo te Deus meus Rex*, &c. If one tell an Ass in his ear that hee is stung by a Scorpion, they saie that the danger is immediately over.

As there are manie superstitious words, so there are many superstitious writings also. To help sore eies, a paper wherein the two greek letters, Ρ and Α, are written must bee tied in a thread, and hanged about the neck. And for the tooth ache this ridiculous saying, *Strigiles, falcéque dentatæ, dentium dolorem persanate*. Also oft times there is no small superstition in things that are outwardly applied. Such is that of *Apollonius* in *Plinie*, to scarifie the gums in the tooth-ach, with the tooth of one that died a violent death: to make pils of the skul of one hanged, against the bitings of a mad dog: to cure the falling sickness by eating the flesh of a wilde beast, killed with the same iron wherewith a man was killed: that hee shall bee free'd from a quartain ague who shall drink the wine whereinto the sword that hath cut off a man's head, shall bee put; and hee, the parings of whose nails shall bee tied in a linnen cloth to the neck of a quick Eel, and the Eel let go into the water again. The pain of the Milt to bee asswaged, if a beast's Milt bee laid upon it, and the Physician saie that hee cure's or make's a medicine for the Milt. Anie one to bee free'd from the cough, who shall spit in the mouth of a Toad, letting her go away alive. The halter wherein one hath been hanged put about the temples, to help the head-ach. This word *Abracadabra*, written on a paper, after the manner described by *Serenus*, and hanged about the neck, to help agues or fevers, especially semitertians. What truth can bee in that which sundrie affirm, that a leaf of *Lathyris*, which is a kinde of Spurge, if it bee plucked upwards, will cauſ vomit, but broken downwards, will moov to stool? You may also finde manie other superstitious fictions concerning herbs, such as *Galen* report's that *Andreas* and *Pamphilus* writ, as incantations, transformations, and herbs dedicated to conjurers and devils. *Lib. 6. de simp.*

I had thought never in this place to have mentioned these and the like, but that there may bee every where found such wicked persons, who leaving the arts and means, which are appointed by God to preserv the health of man's bodie, flie to the superstitious and ridiculous remedies of sorcerers, or rather of devils, which notwithstanding the devil somtimes

make's to perform their wish't for effects, that so hee may still keep them ensnared and addicted to his service. Neither is it to bee approoved which manie say, that it is good to bee healed by anie art or means, for that healing is a good work. This saying is unworthy of a Christian, and savor's rather of him that trust's more to the devil then in God. Those Empericks are not of the societie of Sorcerers and Magitians, who heal simple wounds with drie lint, or lint dip't in water: this cure is neither magical nor miraculous, as many suppose, but wholly natural, proceeding from the healing fountains of nature, wounds and fractures, which the Surgeon may heal by onely takeing away the impediments, that is pain, defluxion, inflammation, an abscess and gangrene, which retard and hinder the cure of such diseases The following examples will sufficiently make evident the devil's maliciousnes, alwaies wickedly and craftily plotting against our safetie and life.

Lib.epist.38.ep. A certain woman of *Florence* (as *Langius* write's) haveing a malign ulcer, and beeing troubled with intolerable pain at the stomach, so that the Physitians could give her no eas: behold on a sudden shee vomited up long and crooked nails, and brass needles, wrapped up with wax and hairs, and at length a great gobbet of flesh, so big that a Giants jaws could scarce swallow it.

But that which happened in the year of our redemption 1539. in a certain town called *Fugenstal*, in the Bishoprick of *Eistet*, exceed's all credit, unless there were eie-witnesses of approoved integritie yet living. In this town, one *Ulrich Neusesser* an husbandman, was tormented with grievous pain in the one side of his bellie, hee suddenly got hold of an iron key with his hand under the skin, which was not hurt, the which the Barbar-Surgeon of the place cut out with a razor; yet for all this the pain ceased not, but hee grew every daie worse then other: wherefore expecting no other remedie but death, hee got a knife and cut his throat. His dead bodie was opened, and in his stomach were found a round and loggish piece of wood, four steel knives, part sharp, and part toothed like a saw, and two sharp pieces of iron, each whereof exceeded the length of a span, there was also as it were a ball of hair. All these things were put in by the craft and deceit of of the devil. Thus far *Langius*.

CHAP. XVIII.

Of the Cozenages and crafty Tricks of Beggars.

HAveing treated of Monsters, it follow's that wee speak of those things which either of themselvs, by reason of their nature full of admiration, have som kind of monstrousnes in them; or elf from som other waies, as by the craft and cozenage of men. And becaus to the last mentioned crafts of the Devil, the subtle devices of begging companions are somwhat alike, therefore I will handle them in the next place, that the Surgeon beeing admonished of them, may bee more cautious and cunning in discerning them when hee meet's with them.

An historie of a counterfeit arm. *Anno Dom.* 1525. when I was at *Anjou*, there stood a craftie beggar begging at the Church door, who tying and hideing his own arm behinde his back, shewed in steed thereof, one cut from the bodie of one that was hanged, and this hee proped up and bound to his brest, and so laid it open to view, as if it had been all enflamed, so to moov such as passed by unto greater commiseration of him. The cozenage lay hid, every one giving him monie, until at length his counterfeit arm not beeing surely fastened, fell upon the ground, many seeing and observing it: hee beeing apprehended and laid in prison, by the appointment of the Magistrate, was whipped through the town, with his falf arm hanging before him, and so banished.

Another of a cancrous brest I had a brother called *John Parey*, a Surgeon, who dwelt in *Vitre* in *Britanie*; hee once observed a young woman begging, who shewed her breast, as if it had a cancrous ulcer thereon, looking fearfully by reason of much sordid filth, wherewith it seemed to defile the cloth that lay under it. But when as hee had more diligently beheld the woman's face, and the fresh color thereof, as also of the places about the ulcer, and the good habite of the whole bodie agreeable to that color (for shee was somwhat fat, and of a very good habit of bodie) hee was eatily hereby induced to suspect som roguery and deceit. Hee acquainted the Magistrate with this his suspicion, and got leav that hee might carrie her home to his houf, so to search her more narrowly. Where opening her breast, hee found under her arm-pit, a spong moistned with a commixture of beast's bloud and milk, and carried through an elder-pipe to the hidden holes of her counterfeit cancer. Therefore hee foment's her breast with warm water, and with the moisture thereof looseth the skins of black, green, and yellow frogs, laid upon it, and stuck together with glew, made of bole armenick, the white of an egg, and flower; and these beeing thus fetched off, hee found her breast perfectly sound.

The beggar beeing cast for this into prison, confessed that shee was taught this trick by a beggar that lay with her, who himself also, by putting about his leg an Oxes Milt, and perforating it in sundry places, that so the forementioned liquor might drop out, counterfeited an ulcer of a monstrous bigness and malignitie, covering the edges of the Milt on every side

side with a filthie cloth. This beggar was diligently enquired after, but could not bee found; and so shee was whipped and banished.

Within less then a year after, there came into the same citie another notable craftie companion, who presently takeing up the Church doors, laid open his wares; to wit, a Kercher with som small pieces of monie lying thereon, a wooden Barrel, and * Cliquets, wherewith hee would ever now and then make a great noise: his face was spread over with great thick pustles, beeing of a blackish red color, and made with glue like those that have the Leprosie: this his ghastly look made him to bee pitied by all men, which was the cause that everie one gave him monie. Then my brother came somwhat nearer him, and asked him how long hee had been troubled with this so cruell disease; hee answered with an obscure and hoarse voice, that hee was born a Leper from from his mother's wvmb, and that his parents both died of this wicked disease, so that their members fell away piece-meal. Now hee had a woollen swathe about his chaps, wherewith (haveing his left hand under his cloak) hee so straitned his chaps, that much black bloud rose into his face, and made him so hoarse that hee could scarce speak; yet hee could not contain himself, but that in speaking hee ever now and then slackned the swathe with his hand, the freelier to draw his breath: which when my brother had observed, suspecting som cozenage, hee obtained leav of the Magistrate to search and examine the man whether hee were truly leprous, or no. First therefore hee took away his swathe or rowler that was about his neck, then washed his face with warm water, so that the counterfeit glued pustles were dissolved, and his face (free from all tainture) shewed it self of a good and natural color and shape. Then hee laid bare his whole body, and diligently viewed each part, and found no sign of a Leprosie, one or other. Which when the Magistrate once heard, hee made him to bee put in prison, and to bee thrice whipped through the streets of the citie, with his barrel hanging before him, and his cliquets behinde him, adding thereto the punishment of perpetual banishment. It hap'ned that as hee was whipped the third market-day, the people cried out to the hang-man in jest, that hee should not fear to lash him soundly, for beeing leprous hee could not feel it: the executioner incited by this crie of the people, did so belabor him, that the wretch died of his whipping within a short while after, haveing a just reward for his wickedness. For these impostors, besides that they live like drones, feigning this or that disease, and so beeing idle, enjoy the fruits of others labors; they also divers times conspireing together, take away the lives and goods of honest and substantial citizens, and other people: for there are som of them, that in an evening, as men that have no habitation, desire lodging for a night, and it beeing granted them, they, when as the master of the house and his familie are asleep, open the doors to their comrades, men as wicked as themselvs, and kill and carrie away all they can.

Of one feigning himself leprous.

* Cliquets are things made somwhat resembling a small wool-card, but have two or three little pieces of boards so fastned together with leather, that they will make a great noise with them and these are used by the French beggars.

Certainly wee may justly affirm, that this craftie begging is the mother and school of all dishonestie: for how manie acts of bawdrie and poisoning everie where corrupt the wells and publick fountains? How manie places have been burnt under the shew of begging? Where can you get more fit spies? Where more fit undertakers and workers of all manner of villanie, then out of the crew of these beggers?

A multitude of beggars hurtful to the citie.

Som of them there are, who besmear their faces with soot laid in water, so to seem to have the Jaundis. But you may at the first sight finde out the deceit, by the native whitenes of the utter coat of the eie, called *Adnata*, which in such as truly have the Jaundis, useth to bee died and overcast with a yellowish color; also you may bee more certain thereof, if you wet a cloth in water or spittle, and so rub the face, for the adventitious yellowness will quickly vanish, and the true native color shew it self.

How to discover such a counterfeit the Jaundis.

Som there bee, who not content to have mangled, and filthily exulcerated their limbs with canstick herbs, and other cauteries; or to have made their bodies more swoln, or elss lean, with medicated drinks; or to have deformed themselvs som other waie, but from good and honest Citizens, who have charitably relieved them, they have stoln children, have broken or dislocated their arms and legs, have cut out their tongues, have depressed the chest, or whole breast; that with these, as their own children, begging up and down the countrie, they may get the more relief, pitifully complaining that they came by this mischance by thunder, or lightning, or som other strange accident.

Lastly, they part the Kingdom amongst themselvs as into Provinces, and communicate by letters one to another, what news or new quaint devises there are to conceal or advance their roguerie: to which purpose they have invented a new language onely known to themselvs, so to discourse together and not to bee understood by others. [Wee here vulgarly term it *Canting*.]

Dr. *Flecelle*, a Physician of *Paris*, entreated mee to bear him companie to his countrie house at *Champigny*, four miles from *Paris*. Where assoon as wee arrived, and were walking in the Court, there came presently to us a good lustie well fleshed manlie woman, begging alms for St. *Fiacre* sake, and takeing up her coat and her smock, shee shewed a great gut hanging down som half a foot, which seemed as if it had hanged out of her fundament, whereout there dropped filth like unto *pus*, which had all stained her legs and smock, most beastly and filthie to look upon. *Flecelle* asked her how long shee had been troubled with this disease: shee

Of one counterfeiting the falling of the fundament.

ſhee anſwered that it was four years ſince ſhee firſt had it. Hence hee eaſily gathered that ſhee plaied the counterfeit: for it was not likelie that ſuch abundance of purulent matter came forth of the bodie of ſo well fleſh't and colored a woman; for ſhee would rather have been verie lean and in a conſumption. Wherefore provoked with juſt anger, by reaſon of the wickedneſs of the deceit, hee run upon her and threw her down upon the ground, and trod her under his feet, and hit her divers blows upon the bellie, ſo that hee made the gut, which hung at her, to com away, and by threatning her with more grievous puniſhment, made her confeſs the cozenage, and that it was not her gut, but of an ox, which being filled with bloud and milk, and tied at both ends, ſhee put the one of them into her fundament, and let the filth flow forth at verie little holes.

Of one feigning the falling down of the womb.

Not verie long ago, a woman equally as ſhameleſs, offered her ſelf to the overſeers of the poor of *Paris*, entreating that ſhee might bee entred for one of their Penſioners, for that her womb was fallen down by a dangerous and difficult birth, wherefore ſhee was unable to work for her living. Then they commanded that ſhee ſhould bee tried and examined, according to the cuſtom, by the Surgeons which are therefore appointed. Who ſeeing how the whole buſineſs was carried, made report ſhee was a counterfeit; for ſhee had thruſt an ox's bladder, half blown and beſmeared with beaſtlie bloud by the neck, whereto ſhee had faſtned a little ſponge, into the neck of her womb, for the ſponge beeing filled and ſwollen up by the accuſtomed moiſture of the womb, ſo held up the ox's bladder that hanged thereat, that ſhee might ſafely go vvithout anie fear of the falling of it out, neither could it bee pulled forth but vvith good force. For this her device ſhee vvas put into priſon, and beeing firſt vvhipped, vvas after baniſhed. Their cozenage is not much unlike this, vvho by fitly applying a ſheep's paunch to their groin, counterfeit themſelvs to bee burſten.

Of a begger that feigned her ſelf to have a ſnake in her bellie.

Anno Dom. 1561. there came to *Paris* a luſtie, ſtout, and verie fat Norman vvoman, beeing about ſom thirtie years old, who begging from door to door, did caſt to meet with rich women, and verie familiarly and pittifully would relate unto them her misfortune; ſaying, ſhee had a ſnake in her bellie, which crep't in at her mouth as ſhee ſlep't in an hemp-land: ſhee would let one feel her ſtir, by putting their hand unto her bellie, adding alſo that ſhee was troubled daie and night with it's unceſſant gnawing of her guts. The noveltie of this ſad chance, mooved all to pitie and admiration, wherefore as much as they could, they aſſiſted her with means and counſel. Amongſt the reſt, there was a woman of great devotion and charitie, who ſending for Dr. *Hollerius*, *Chevall*, and mee, asked us if this ſnake could by anie means be gotten forth. *Hollerius* gave her a ſtrong purgation, hopeing that by ſtirring up the expulſive facultie, the ſerpent might bee caſt forth, together with the noxious humors. But this hope had no ſuch ſucceſs. Wherefore when as wee met again, wee thought it fit to put a *Speculum matricis* into the neck of her womb, ſo to ſee if wee could diſcern either her head or tail: but I makeing large dilatation of her womb, could ſee no ſuch thing, onely wee obſerved a certain voluntarie motion, whereof ſhee her ſelf was the author, by contracting and dilateing the muſcles of the lower bellie. Which when as wee had obſerved, perceiving the deceit and impoſture, wee thought good ſo to terrifie and her, and make her confeſs the deceit, to tell her that ſhee muſt take another, but that a more ſtrong purgation; that what wee could not do by the former, as more gentle, wee might attain to by the later, as far ſtronger. Shee diſſembling all fear, and conſcious of her craft and diſſimulation, after wee were gon in the evening, packing up her ſtuff, and a great deal more then her own, ſhee ſecretly ſtole away, not bidding her hoſteſs farewel: and thus at length the fraud was apparent, to the loſs of the honeſt gentlewoman. I ſaw this baggage, ſix daies after, ſitting luſtily upon a Pack-horſ, at the gate *Mont-martre*, and laughing heartily with ſuch as brought Sea-fiſh to town; and ſhee was returning (as it was moſt likely) into her countrie, ſeeing her cozenage was diſcovered here.

The craft of ſuch as feign themſelvs to have the falling ſickneſs. Of ſuch as feign themſelvs leprous.

Such as feign themſelvs dumb, draw back and double their tongues in their mouths. Such as falling down counterfeit the falling ſickneſs, binde ſtraitly both their wreſts with plates of iron, tumble and rowl themſelvs in the mire, ſprinkle and defile their heads and faces with beaſts bloud, and ſhake their limbs and whole bodie. Laſtly, by putting ſope into their mouths, they foam at the mouth like thoſe that have the falling ſickneſs. Otherſom with flour make a kinde of glue, wherewith they beſmear their whole bodies, as if they had that Leproſie or Scab, that is vulgarly termed, *Malum ſancti manis*. Neither muſt wee think this art of counterfeiting and cheating begging to bee new, and of late invention, for long ago it flouriſhed in *Aſia*, even in the time of *Hippocrates*, as may appear by his book *De Aere, Locis, & Aquis*. But by how much this diſeaſ hath taken more deep root, and grown more inveterate by proceſs of time, by ſo much it muſt more diligently and carefully bee looked to and prevented, by cruelly puniſhing ſuch counterfeits: for that by this feigned begging, as the nouriſher of ſloth, and ſhop of all diſhoneſtie, that which is taken from the good is beſtowed upon the ill, and one wicked and counterfeit begger hurt's all other wretched people.

CHAP.

CHAP. XIX.

Of strange or monstrous accidents in diseases.

WHat monstrousnes soever was in the last mentioned parties, it was made up by the craft of beggars for filthie gain. But if there bee anie monstrousnes in the following narrations, it is of nature, but working, as it were, miraculously, by som secret and occult means; for thus there are oft times monsters in diseases. Before the town of St. *John de Angeley*, a souldier called *Francis*, of the companie of Captain *Muret*, was wounded with a Harquebuz-shot on the bellie, between his navel and sides; the bullet was not taken out, becaus the Surgeons, who searched him diligently, could not finde it: wherefore hee was troubled with grievous and tormenting pains, until the ninth daie after hee received the wound, the bullet came forth at his fundament: wherefore within three weeks after hee was perfectly whole. Hee was healed by *Simon Crinay*, the Surgeon of the French companies.

Monsters happen also in diseases.

A bullet shot into the bellie came forth at the fundament.

James Pope, Lord of St. *Albans* in *Dauphine*, was wounded at the skirmish at *Chasenay*, having three harquebuz bullets entring into his bodie, one whereof pierced under his throat, where it buncheth out as with a knot, neer to the pipe of his longs, even to the beginning of the *vertebræ* of the neck, in which place the leaden bullet stuck, and as yet doth remain. Hereupon hee was afflicted with manie and fearful symptoms, as a fever, and a great swelling of his whole neck, so that for ten whole daies hee could swallow nothing but broaths and liquid things. Yet hee recovered, and remaineth well at this present, by the cure of *James Dalan* the Surgeon.

A bullet sticking in the throat and patient recovering.

Alexander Benedictus make's mention of a certain countrie-man, who, shot into the back with a dart, drawing out the shaft, the head was left behinde, beeing in length about the bredth of two fingers, but hooked and sharp on the sides. When as the Surgeon had carefully and diligently sought for it, and could by no means finde it, hee healed up the wound, but two months after this crooked head came forth at his fundament.

Lib. 3. anatom. cap. 9.

A crooked iron shot into the back came forth at the fundament.

The same author telleth that at *Venice* a virgin swallowed a needle, which som two years after shee voided by urine, covered over with a stonie matter, gathered about viscous humors.

A swallowed needle voided by urine.

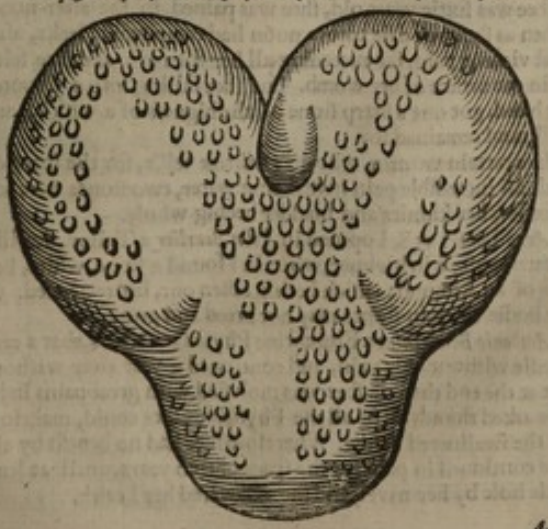
Catherine Perlan, the wife of *William Guerrier*, a Draper of *Paris*, dwelling in the Jewrie, as shee rode on horse-back into the countrie, a needle out of her pin-cushion, was got under her by accident, ran so deep into her right buttock, that it could not by anie art or force bee plucked forth. Four months after shee sent for mee to com to her, and shee told mee that as often as shee had to do with her husband, shee suffered extreme pricking pain in her right groin; putting my hand thereto, as I felt it, my fingers met with somthing sharp and hard: wherefore I used the matter so, that I drew forth the needle all rustie: this may bee accounted a miracle, that steel, naturally heavie, should rise upwards, from the buttock to the groin, and pierce the muscles of the thigh, without causing an abscess.

A needle running in at the buttock came forth at the groin.

Anno Dom. 1566. the two sons of *Laurence Collo* (men excellent in cutting for the stone) took forth a stone of the bigness of a wall-nut, in the mid'st whereof was a needle, just like those that shoo-makers use: the patient's name was *Peter Cocquin*, dwelling in the street *Galand* at the place called *Maubert* at *Paris*, and I think hee is yet living. This stone was shewed to King *Charls* the ninth, for the monstrousnes of the thing, I beeing then present, which beeing given me by the Surgeon, I preserv amongst my other rarities.

A needle in the midst of a stone taken forth of the bladder.

The figure of a stone taken forth of the bladder of a Confectioner.



Anno Dom. 1570. the Dutchess of *Ferrara* at *Paris*, sent for *John Collo*, to take a stone out of a Confectioner. This stone, though it weighed nine ounces, & was as thick as one's fist, yet was it happilie taken out, the patient recovering, *Francis Rousset*, and *Joseph Javelle*, the Dutchess Physicians, beeing present. Yet not long after this Confectioner died by the stoppage of his water, by reason of two other little stones, which about to descend from the kidnies to the bladder, staied in the mid-way of the Ureters. The figure of the extracted stone was this.

Anno

Anno Dom. 1569. *Laurence Collo* the younger, took three ſtones out of the bladder of one dwelling at *Marly*, called commonly *Tire-vit*: becauſ beeing troubled with the ſtone from the tenth year of his age, hee continually ſcratched his yard, each of the ſtones were as big as an hen's egg; of color white, they all together weighed twelv ounces. When they were preſented to King *Charls*, then lying at Saint *Maure des Fauſſez*, hee made one of them to bee broken with a hammer, and in the middeſt thereof there was found another, of a cheſnut color, but otherwiſe much like a Peach ſtone. Theſe three ſtones, beſtowed on mee by the brethren, I have here repreſented to the life.

The effigies of the three forementioned ſtones, whereof one is broken.

I have in the diſſecting of dead bodies, obſerved divers ſtones, of various forms and figures, as of pigs, whelps, and the like. *Dalechampius* telleth that hee ſaw a man, which by an abſceſs of his loins, which turned to a Fiſtula, voided manie ſtones out of his kidnies, and yet notwithſtanding could endure to ride on horſ-back, or in a coach. *John Magnus*, the King's moſt learned and skilful Phyſician, haveing in cure a woman, troubled with cruel torment and pains of the bellie and fundament, ſent for mee, that by putting a *Speculum* into the fundament, hee might ſee if hee could perceiv anie diſcernable cauſ of ſo great and pertinacious pain: and when as hee could ſee nothing which might further him in the findeing out of the cauſ of her pain (following reaſon as a guid) by giveing her often glyſters and purgations, hee brought it ſo to paſs, that ſhee at length voided a ſtone at her fundament of the bigneſs of a Tennis-ball: which once avoided, all her pains ceaſed.

A ſtone by the force of purging medicines voided by the fundament. 5. *Epid.*

Hippocrates tell's that the ſervant of *Dyſeris* in *Lariſſa*, when ſhee was young, in uſeing venerie was much pained, and yet ſomtimes without pain, yet ſhee never conceived. But when as ſhee was ſixtie years old, ſhee was pained in the after-noon as if ſhee had been in labor. When as ſhee one daie before noon had eaten manie leeks, afterward ſhee was taken with a moſt violent paiu, far exceeding all her former, and ſhee felt a certain rough thing riſeing up in the orifice of her womb. But ſhee falling into a ſwoun, another woman putting in her hand, got out a ſharp ſtone of the bigneſs of a whirl, and then ſhee forthwith became well, and remained ſo.

A ſtone comming out of the neck of the womb.

Lib. 1. cap. de palp. cond.

In a certain woman, who, as *Hollerius* tell's, for the ſpace of four months was troubled with an incredible pain in makeing water, two ſtones were found in her heart, with manie abſceſſes, her kidnies and bladder beeing whole.

Anno Dom. 1558. I opened in *John Bourlier* a Tailor, dwelling in the ſtreet of St. *Honoré*, a watrie abſceſs in his knee, wherein I found a ſtone, white, hard, and ſmooth, of the thickneſs of an Almond; which beeing taken out, hee recovered. Certainly there is no part of the bodie wherein ſtones may not breed and grow.

No part of the bodie wherein ſtones may not bee found.

Antbonie Benevenius a Florentine Phyſician write's, that a certain woman ſwallowed a braſs needle without anie pain, and continued a year after without feeling or complaining of it: but at the end thereof ſhee was moleſted with great pains in her bellie; for helping of which ſhee asked the adviſe of all the Phyſicians ſhee could, makeing, in the interim, no mention of the ſwallowed needle. Wherefore ſhee had no benefit by all the medicines ſhee took; and ſhee continued in pain for the ſpace of two years, until at length the needle came forth at a little hole by her navel, and ſhee recovered her health.

A needle ſwallowed, came forth at the navel ſom two years after.

A Scholar

A Scholar named *Chambelant*, a native of *Bourges*, a student in *Paris*, in the Colledg of *Presse*, swallowed a stalk of grass, which came afterwards whole out between two of his ribs, with the great danger of the scholar's life. For it could com there nnless by passing or breaking through the lungs, the encompassing membrane, and the intercostal muscles, yet hee recovered, *Fernelius* and *Haguet* having him in cure. A sprig of grass swallowed came forth whole again between the ribs.

Cabrolle Chirurgian to *Mounsieur* the Marshal of *Anville*, told mee that *Francis Guillenet* the Chirurgian of *Sommiers*, a small village som eight miles from *Mompelier*, had in cure, and healed a certain Shepherd, who was forced by theevs to swallow a knife of the length of half a foot, with a horn handle of the thickness of ones thumb: hee kept it the space of half a yeer, yet with great pain, and hee fell much away, but yet was not in a consumption, until at length an abscess tiseing in his groin, with great store of verie stinking quitture, the knife was there taken forth in the presence of the Justices, and left with *Joubert* the Physician of *Mompelier*. A knife swallowed, came forth at an abscess in the groin.

Mounsieur the Duke of *Roban* had a Fool called *Guido*, who swallowed the point of a sword of the length of three fingers, and hee voided it at his fundament on the twelfth daie following, yet with much adoo: there are yet living manie Gentlemen of *Britanie*, who were eie-witnesses thereof. The point of a sword swallowed came forth at the fundament.

There have been sundrie women with childe, who have so cast forth piece-meal children that have died in their wombs, as that the bones have broke themselvs a passage forth at the navel, but the flesh, dissolved as it were into quitture, flowed out by the neck of the womb and the fundament, the mothers remaining alive, as *Dalechampius* observ's out of *Albucrasis*. Wonderful excretions of infants out of the womb.

Is it not verie strange that there have bin women, who troubled with a fit of the Mother, have lien three whole daies without motion, without breathing, or pulse that were anie waie apparent, and so have been carried out for dead? Women troubled with the Mother laid out for dead.

A certain young man, as *Fernelius* tell's, by somwhat too vehement exercise, was taken with such a cough, that it left him not for a moment of time, until hee therewith had cast forth a whole impostume of the bigness of a pigeon's egg, wherein, beeing opened, there was found quitture exquisitely white and equal. Hee spit blood two daies after, had a great fever, and was much distempered, yet notwithstanding hee recovered his health. An impostume spit out, of the bigness of a Pigeon's egg.

Anno Dom. 1578. *Stephana Chartier*, dwelling at St. *Maure des Fausez*, a widow of fortie yeers old, beeing sick of a tertian Fever, in the beginning of her fit vomited up a great quantitie of choler, and together therewith three hairie worms, in figure, color, and magnitude like the worms called Bear-worms, yet somwhat blacker; they lived eight whole daies after without anie food: the Chirurgian of this town brought them to Dr. *Milot*, who shewed them to *Feure*, *Le Gros*, *Marescot* and *Courtin* Physicians, and to mee also. Worms cast up in the fit of an Ague.

This following historie, taken out of the Chronicles of *Monstrele*, exceed's all admiration. A certain Franck-Archer of *Meudon*, four miles from *Paris*, was for robberie condemned to bee hanged: in the mean time it was told the King by the Physicians, that manie in *Paris* at that time were troubled with the stone, and amongst the rest the Lord of *Boscage*, and that it would bee for the good of manie, if they might view and discern with their eies the parts themselvs wherein so cruel a disease did breed, and that it might bee don much better in a living then in a dead bodie, and that they might make trial upon the bodie of the Franck-Archer, who had formerly been troubled with these pains. The King granted their request; wherefore opening his bodie they viewed the breathing parts, and satisfied themselvs as much as they desired, and having diligently and exactly restored each part to its proper place, the bodie, by the King's command, was sewed up again, and dressed and cured with great care. It came so to pass, that this Franck-Archer recoverd in a few daies, and getting his pardon, got good store of monie besides. This narration exceed's not onely all admiration, but also belief.

Alexander Benedictus tell's that hee saw a woman called *Victoria*, who having lost all her teeth, and beeing bald, yet had others came up in their places, when as shee was fourscore yeers old.

Stephen Tessier a Chirurgian of *Orleance*, told mee that not long ago hee cured one *Charls Verignel*, a Serjeant of *Orleance*, of a wound received in his ham, whereby the two tendons bending the ham, were quite cut in sunder. Hee took this order in the cure; hee caused the patient to bend his leg, then hee sewed together the ends of the cut-tendons, then placed the member in that site, and handled with that art, that at length hee healed the wound, the patient not halting at all. Truly this is a memorable thing, and carefully and heedfully to bee imitated by the young Chirurgian. *Pract. lib. 64. cap. 1.*

How manie have I seen, who wounded and thrust through the bodie with swords, arrows, pikes, bullets, have had portion of the brain cut off by a wound of the head, an arm or leg taken away by a cannon-bullet, yet have recovered? and how manie on the contrarie, have died of light and small wounds, not worth the speaking of.

A certain man was shot in near to his groin with an arrow, whom wee have seen, saith *Hippocrates*, and hee recovered beyond all men's expectation; The arrow's-head was not taken forth, for it was verie deep in, neither did the wound bleed verie much, neither did hee halt: but wee found the head, and took it forth six yeers after hee was hurt. *5. Epidem.*

Now

Now *Hippocrates* give's no reason of it's so long staie, but that hee saith it might bee suspected it laie hid between the nervs, and that no vein nor arterie was cut thereby.

CHAP. XX.

Of the wonderful original, or breeding of som creatures.

Boist. in histor. prodig.

WEE have read in *Boistey*, that a certain work-man of *Avignion*, when as hee lived in that cittie, opened a leaden coffin, wherein a dead bodie laie, that was so closely saudered, that the air could not get in; and as hee opened it, hee was bitten by a serpent that laie therein, with so venomous and deadlie a bite, that it had neer to have cost him his life. Yet the original of this creature is not so prodigious as hee supposeth, for it is an usual thing for a Serpent to breed of anie putrefied carcass, but chiefly of man's.

It is a common thing for a serpent to breed of the dead corp's of a man.

Baptista Leo write's, that in the time of Pope *Martin* the fifth, there was a live-Serpent found enclosed in a vaste, but solid Marble, no chink appearing in such dens soliditie, whereby this living creature might breathe.

A live serpent in a solid Marble.

Whilest in my vine-yard, that is at *Meudon*, I caussed certain huge stones to bee broken to pieces, a Toad was found in the mid'st of one of them. When as I much admired thereat, becaus there was no space wherein this creature could bee generated, increas, or live; the Stone-cutter wished mee not to marvel thereat, for it wss a common thing, and that hee saw it almost everie daie. Certainly it may com to pass, that from the more moist portion of stones, contained in places moist and under ground, and the celestial heat mixing and diffusseing it self over the whole mass of the world, the matter may bee animated for the generation of these creatures.

The caus of such wonderful generations.

CHAP. XXI.

Of the wondrous nature of som marine things, and other living creatures.

THe last mentioned creatures were wonderful in their original, or rather in their growth: but these which follow, though they bee not wonderful of themselvs, as those that consist of their own proper nature, and that working well and after an ordinarie manner; yet they are wondrous to us, or rather monstrous, for that they are not verie familiar to us. For the raritie and vastnes of bodies, is in som sort monstrous. Of this fort there are manie, especially in the Sea, whose secret corners and receptacles are not pervious to men: as Tritons, which from the middle upwards are reported to have the shape of men. And the *Sirenes*, *Nereides* or Meremaids, who (according to *Plinie*) have the faces of women, and scalie bodies; yea, where as they have the shape of man: neither yet can the forementioned confusion and conjunction of seeds take anie place here, for as wee lately said, they consist of their own proper nature.

Lib. 9. cap.

When *Mena* was President of *Egypt*, and walked on the banks of *Nilus*, hee saw a Sea-monster in the shape of a man, comming forth of the waters: his shape was just like to a man even to the middle, with his countenance composed to gravitie, his hair yellow, yet intermixed with som graie, his stomach bonie, his arms orderly made and jointed, his other parts ended in a fish. Three daies after in the morning, there was seen another Sea-monster, but with shape or countenance of a woman, as appeared by her face, her long hair, and swoln breasts: both these monsters continued so long above water, that anie one might view them verie well

The effigies of the Triton *and* Siren *of* Nilus.

In

In our times, saith *Rondeletius*, in *Norway* was a monster taken in a tempestuous sea, the which as manie as saw it, presently termed a Monk, by reason of the shape which you may see here set forth.

The figure of a fish resembling a Monk.

The figure of a fish in the habit or shape of a Bishop.

Anno Dom. 1531. there was seen a sea-monster in the habit of a Bishop, covered over with scails: *Rondoletius* and *Gesner* have described it.

Gesner professeth that hee received from *Jerom Cardane* this monster, having the head of a Bear, the feet and hands of an Ape.

The effigies of a Sea-monster headed like a Bear.

The effigies of a Lion-like scalie Sea-monster.

Not long before the death of Pope *Paul* the third, in the midst of the Tyrrhene sea, a monster was taken, & presented to the successor of of this *Paul:* it was in shape & bigness like to a Lion, but all scalie; and the voice was like a man's voice. It was brought to *Rome* to the great admiration of all men, but it lived not long there, beeing destitute of it's own natural place and nourishment, as it is reported by *Philip Forrest.*

Lib. 5. Chron.

Anno Dom. 1523. the third daie of *November*, there was seen at *Rome* this sea-monster, of the bigness of a childe of five years old, like to a man even to the navel, except the ears; in the other parts it resembled a fish.

The effigies of a Sea-monster with a man's face.

Gesner make's mention of this Sea-Monster, and saith that hee had the figure thereof from a Painter, who took it from the verie fish, which hee saw at *Antwerp*. The head look's verie ghastly, having two horns, prick-ears, and arms not much unlike a man, but in the other parts it was like a fish. It was taken in the Illyrian Sea, as it came a shore out of the water to catch a little childe: for being hurt by stones cast by fisher-men that saw it, it returned a while after to the shore from whence it fled, and there died.

The effigies of a Sea-Devil.

Gesner tel's that a Sea-monster with the head, mane, and breast of a horse, and the rest of his bodie like a fish, was seen and taken in the ocean-Sea, brought to *Rome*, and presented to the Pope.

Olaus Magnus tel's that a Sea-monster taken at *Bergen*, with the head and shape of a Calf, was given him by a certain English Gentleman. The like of which was presented lately to King *Charls* the ninth, and was long kept living in the waters at *Fountain-Bleau*, and it went oft-times a shore. This is much different from the common Sea-calf or Seal.

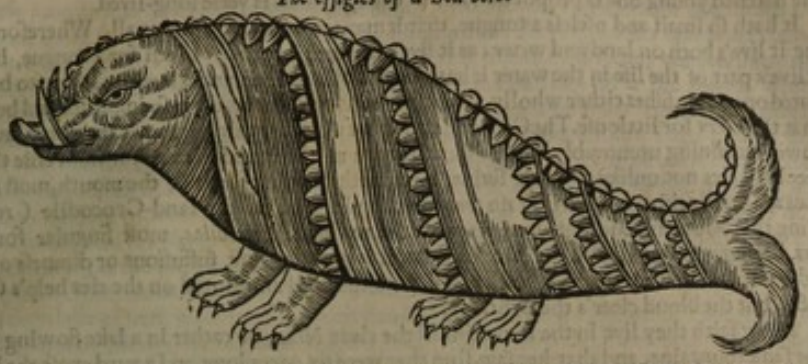
*The effigies of a monstrous * Sea-calf,*

*, This here figured is the sea-Morse, taken commonly by our men in their greenland voiages: and I judg the sea-Bore and Elephant to bee the same, but that the Painter hath shewed his skil too much in the one: and the other is an old Morse, as this here figured is a young one.

This

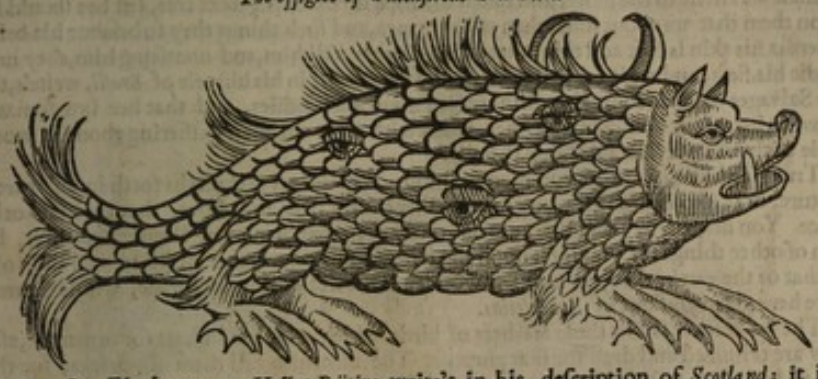
This great monster was seen in the Ocean-sea, with the head of a Bore, but longer tusks, sharp and cutting, with scails set in a wonderful order, as you may see by this figure.

The effigies of a Sea-bore.



Olaus Magnus writes that this monster was taken at *Thyle* an Island of the North, *Anno Dom.* 1538. it was of a bigness almost incredible, as that which was seventie two foot long, and fourteen high, and seven foot between the eies: now the liver was so large that there with they filled five hogsheads, the head resembled a swine, having as it were a half-Moon on the back, and three eies in the mid'st of his sides, his whole bodie was scalie.

The effigies of a monstrous Sea-Swine.



The Sea-Elephant, as *Hector Boëtius* write's in his description of *Scotland*; it is a creature that live's both in the water and ashore, having two teeth like to Elephants, with which as oft as hee desire's to sleep, hee hang's himself upon a rock, and then hee sleep's so soundly, that Mariners seeing him at sea, have time to com ashore and to binde him, by casting strong ropes about him. But when as hee is not awaken'd by this means, they throw stones at him, and makes a great noise; with which awakned, hee endevour's to leap back into the sea with his accustomed violence, but findeing himself fast, hee grow's so gentle, that they may deal with him as they pleas. Wherefore they then kill him, take out his fat and divide or cut his skin into thongs, which becaus they are strong and do not rot, are much esteemed of.

The effigies of a Sea-Elephant.

The Arabians of Mount *Mazavan*, which run's along'st the Red Sea, chiefly feed on a fish called *Orobone*, which is verie terrible and much feared by other fish, beeing nine or ten foot long, and of the breadth agreeable thereto, and it is covered with scales like a Crocodile

A Crocodile is a vast creature, comming sometimes to bee fifteen cubites long, and seeing it is a creature that doth not bring forth young, but eggs, it useth at the most to laie som sixtie eggs, no bigger then Goose eggs, riseng to such bigness from so small beginnings (for the hatched young one is proportionable to the egg) shee is verie long-lived.

It hath so small and useless a tongue, that it may seem to have none at all. Wherefore seeing it live's both on land and water; as it live's on land it is to bee taken for a tongue, but as it live's part of the life in the water it hath no use of a tongue, and therefore is not to bee reputed one. For fishes either wholly want tongues, or elf have them so impedite and bound, that they serv for little use. The Crocodile onely of all other things moov's the upper jaw, the lower remaining unmovable: for her feet, they are neither good to take nor hold anie thing; shee hath eies not unlike those of swine, long teeth standing forth of the mouth, most sharp claws, a scailie skin, so hard that no weapon can pierce it. Of the land-Crocodile (resembling this both land and water one) is made the medicine *Crocodilea*, most singular for sore eies, beeing annointed with the juice of leeks, it is good against suffusions or dimness of the sight; it take's away freckles, pustles, and spots; the Gall annointed on the eies help's Cataracts, but the bloud clear's the sight.

The Crocodile onely moov's the upper jaw.

Expende diligenter Plinii locum lib. 28. c. 8

Thevet saith they live in the fountains of the river *Nilus*, or rather in a lake flowing from the same fountains, and that hee saw som that were six paces long, and a yard cros's the back, so that their verie looks were formidable. They catch them thus; when as the water of *Nilus* fal's, the Egyptians let down a line, haveing thereto fastened an iron hook of som three pound waight, made verie large and strong, upon this hook they put a piece of flesh of a Camel or som other beast; which when as hee see's, hee presently fal's upon it, and devour's it hook and all, wherewith when hee finde's himself to bee cruelly pulled and pinched, it would delight you to see how hee fret's and leap's aloft; then they draw him thus hooked, by little and little to the shore, and fasten the rope surely to the next tree, lest hee should fall upon them that are about him; then with prongs, and such things they so belabor his bellie, whereas his skin is soft and thin, that at length they kill him, and uncaseing him, they make readie his flesh, and eat it for delicious food. *John Lereus*, in his historie of *Brasil*, write's, that the Salvages of that countrie willingly feed upon Crocodiles, and that hee saw som who brought into their houses young ones, wherewith their children gathering about it, would plaie without receiving anie harm thereby.

Cosmographe tom. 1. l. 2. c. 8.

How they take Crocodiles.

Cap. 10.

Lib. 9. cap. 2.

True (saith *Plinie*) is that common opinion, Whatsoever is brought forth in anie part of Nature, that also is in the sea, and manie other things over and above, that are in no other place. You may perceiv that there are not onely the resemblances of liveing creatures, but also of other things; if you look upon the sword, saw, cucumber, like in smel and color to that of the earth, that you may less wonder at the Sea-feather and grape, whose figures I have here given you out of *Rondeletius*.

The sea-feather is like those feathers of birds, which are worn in hats for ornament, after they are trimmed and dres't for that purpose. The fishermen call them sea-pricks, for that one end of them resembleth the end of a man's yard, when the prepuce is drawn off it. As long as it is alive it swel's, and becom's somtimes bigger and somtimes lesser; but dead, it becom's verie flaccid and lank: it shine's bright on the night like a star.

You may by this gather, that this which wee here expres's is the Grape whereof *Plinie* mak's mention, becaus in the surface and upper part the reof it much resemble's a fair bunch of Grapes; it is somwhat longish, like a mis-shapen club, and hang's upon a long stalk. the inner parts are nothing but confusion, somtimes distinguished with little glandules, like that wee have here figured alone by it self.

The figures of the Sea-Feather and Grape.

In the Sea near the Island *Hispaniola* in the West Indies, there may bee seen manie monstrous fishes, amongst which *Thevet* in his Cosmographie thought this most rare and observable, which in the vulgar language of the natives is termed *Aloes*. For it is just like a goos, with a long and straight neck, with the head ending sharp, or in a Cone, not much unlike a sugar-

sugar-pear, it is no bigger than a goose, it wanteth scails, it hath foure fins under the bellie for swimming, when it is above water you would saie that it were a goose.

The Sarmatian, or Eastern Germane Ocean contain's fishes unknown to hot countries, and verie monstrous. Such is that which resembling a snail, equal's a barrell in magnitude of bodie, and a stag in the largeness and branches of her horns: the ends of her horns are rounded as it were into little balls, shineing like unto pearls, the neck is thick, the eies shineing like unto little candles, with a roundish nose set with hairs like to a cat's, the mouth wide, whereunder hang's a piece of flesh verie uglie to behold. It goe's on foure legs, with so manie broad and crooked feet, the which with a long tail, and variegated like a Tiger, serv's her for fins to swim withal. This creature is so timerous, that though it be an *Amphibium*, that is, which live's both in the water and ashore, yet usually it keep's it self in the sea, neither doth it com ashore to feed, unless in a verie clear season. The flesh thereof is verie good and grateful meat, and the bloud medicinable for such as have their livers ill affected, or their lungs ulcerated, as the bloud of great Tortoises is good for the Leprosie. *Thevet* in his Cosmographie affirmeth that hee saw this in *Denmark*.

The bloud of great Tortoises good for the leprosie. *Tom. 2. lib. 21.*

In a deep lake of fresh water, upon which stand's the great cittie or town of *Themistitan*, in the Kingdom of *Mexico*, which is built upon piles, like as *Venice* is, there is found a fish of the bigness of a calf, called by the Southern Salvages, *Andura*, but by those of the place, and the Spaniards the conquerers of that place, *Hoga*. It is headed and eared almost like a swine; from the chaps hang five long bearded *appendices*, or the length of som half a foot, like the beard of a Barbel. It hath flesh verie grateful and good to eat. It bringeth forth live young like as the Whale. As it swim's in waters, it seem's green, yellow, red, and of manie colors, like a Chameleon: it is most frequently conversant about the shore-sides of the lake, and there it feed's upon the leavs of the tree called *Hoga*, whence also the fish hath its name. It is fearfully toothed and fierce fish, killing and devouring such as it meeteth withal, though they bee bigger then her self: which is the reason why the Fishermen chiefly desire to kill her, as *Thevet* affirmeth in his Cosmographie.

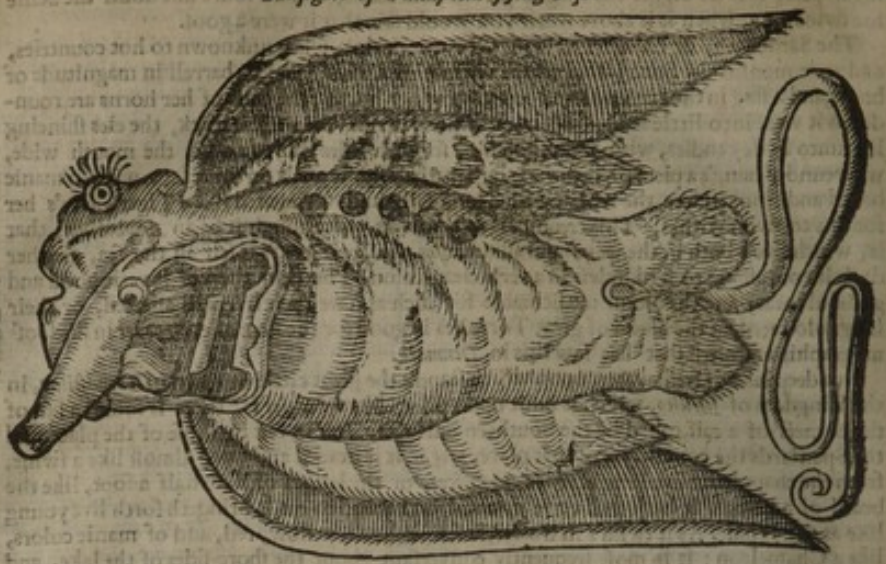
The monstrous fish Hoga.

Andrew Thevet in his Cosmographie write's that as hee sailed to *America*, hee saw infinite store of flying fishes, called by the salvages *Bulampech*, who rising out of the water, flie som fiftie paces, escaping by that means from other greater fish that think to devour them.

This kinde of flying fish exceed's not the bigness of a *Mackrel*, is round headed, with a blewish back, two wings which equal the length of almost all their bodie. They oft-times flie in such a multitude, that they fall foul upon the sails of ships, whilest they hinder one another's flight, and by this means they fall upon the decks, and becom a preie to the sailers: which same thing wee have read confirmed by *John Lereus* in his historie of *Brasil*.

In the Venetian gulf, between *Venice* and *Ravenna*, two miles above *Quioza*, *Anno Dom.* 1550. there was taken a flying fish, verie horrible and monstrous, beeing four foot long, it had a verie great head, with two eies standing in a line, and not one against another, with two ears, and a double mouth, a snout verie fleshie and green, two wings, five holes in her throat, like those of a Lampreie, a tail an ell long, at the setting on whereof there were two little wings. This monster was brought alive to *Quioza*, and presented to the chief of the cittie, as a thing whereof the like had not been formerly seen.

The figure of a monstrous flying Fish.



There are so manie and different sorts of shels to bee found in the Sea, that it may bee truely said, that Nature, the hand-maid of the Almightie, disport's it self in the frameing of them. In so great diversitie I have chiefly made choice of three to treat of here, as those that are worthie of the greatest admiration. In these lie hid certain little fishes, as snails in their shels, which *Aristotle* cal's *Cancelli*, and hee affirmeth them to bee the common companions of the * crusted and shell fishes, as those which in their *species* or kinde are like to Lobsters, and use to bee bred without shels; but as they creep into shels, and there inhabit, they are like to shell fishes. It is one of these that is termed the Hermite. Hee hath two somwhat long and slender horns, under which are his eies, alwaies standing out of his head, as those which hee cannot pluck and draw in, as Crabs can. His fore-feet have claws upon them, wherewith hee defend's himself, and carrie's meat to his mouth, haveing two other on each side, and a third beeing lesser, the which hee useth in going. The female laie's eggs, which hang forth at her back part as if they were put upon a thread, beeing joined together by certain little membranes. Lastly, in the opinion of *Ælian*, the *Cancellus* or small Craie-fish is born naked and without a shell, but within a while after, shee of manie which shee finde's emptie, make's choice of a fit one, and when as grown bigger, shee cannot bee contained or dwell anie longer therein, or else beeing stimulated with a natural desire of copulation, shee remoov's into a more capacious and convenient one. These little Craie-fishes oft-times fight together for their habitation, and the stronger carrie's away the emptie shell, or else make's the weaker to quit possession. Now the shell is either of a *Nerita*, or *Turbo*, and oft-times of a small Purple; and entring into possession, shee carrie's it about, there feed's and grow's, and then seek's a more capacious one, as *Aristotle* saith in the formerly-cited place.

4. *de hist. anim. cap.* 4.

* By crusted is meant Crabs, Lobsters, Shrimps, and such like.

The descriptioe of the Hermite cray-fish.

Lib. 7. *cap.* 31.

They change their habitation for two causes.

The effigies of the emptie shel's whereinto the Cancelli *use to creep to dwell.*

What the *Pinnoter*, or dwarf-crab is.

Som think that this Bernard the Hermit is that kinde of *Cancellus* which is by *Plinie* termed *Pinnoter*; but in truth the *Pinnoter* is not a kinde of *Cancellus*, or Cray-fish, but of a little Crab. Now in *Aristotle* there is much difference between *Cancellus* and *Cancer parvus*, though *Plinie* may seem to confound them; for hee is bred naked, haveing his crust onely, but without a shell: wherefore seeing that by nature hee want's it, hee diligently searche's for it, and dwell's in it, when as hee hath found it: But the *Pinnoter* is not bred by it self alone, but in *Pinnæ* and som others, and hee changeth not his habitation, becaus (as *Aristotle* think's

think's) beeing of the kinde of dwarf-Crabs, it never grow's big, neither dwell's it in emptie shells. Now the *Pinna*, or Pin is a kinde of shell-fish, it breed's in muddie places, and is alwaies open, neither is it at anie time without a companion, which they therefore call the *Pinnoter*, or *Pinnophylax*, (*i.e.*) the Pin-keeper, as *Plinie* saith. Verily that these things are thus, you may plainly perceiv by these words of *Athenæus*. *Chrysippus Solensis* 5. *de Honest. & Volupt.* saith the *Pinna* and *Pinnoter* assist and further each other, neither can they live asunder. The *Pinna* may bee referred to the kindes of oisters, but the *Pinnoter* is a dwarf-crab: the *Pinna* open's her shell for the little fishes to enter thereinto; the *Pinnoter* stand's by, observing if anie com in, which if they do, hee give's the Pin notice thereof by biteing, who presently thereupon shut's her shell, and so they feed together upon that they catch by this means. Thus *Athenæus*. Shee is also for this her craft mentioned by *Plutarch* in his writeings. The *Pinnoter* is somtimes called by *Plinie*, *Cancer dapis assectator*.

What the *Pinna* is. *Lib.9 cap.42.* *Lib.3. Deipno.* The familiaritie and craft of the *Pinna* and *Pinnoter*.

But that which by these authors is attributed to the dwarf-Crab, the same by *Cicero* is ascribed to the little shrimp: Now the *Pinna* (saith hee) opening her two large shells, enter's into confederacie with the little shrimp for getting of food, wherefore when little fishes swim into her gapeing shell, then the *Pinna*, admonished by the shrimp's biteing her, shut's her shell; thus two unlike creatures get their livings together. But *Plutarch* seem's to make the *Pinna* to bee the Pearl-oister, in that work of his, whereas hee inquireth whether the craft of Water or Land-beasts bee the greater. *Lib.2. de nat. deorum.*

The figure of him out of his Cell.

The effigies of Bernard *the Hermite housed in his shell.*

But amongst the most miraculous fishes may fitly bee placed the *Nautilos*, or Sailer, of som called *Pompylos* (it is thought to bee a kinde of *Polypus*) it com's with the face upwards to the top of the Sea, raising it self by little and little, that casting forth all the water by a pipe, as if it had a Pump, it easily float's; then putting back the two first tendrils or arms, it extend's between them a membrane of wondrous fineness or thinness, which gathering air like as a sail, and shee rowing with the rest of her arms, shee guid's her self with her tail in the mid'st, as a Rudder. Thus shee sail's along in imitation of Pinnaces, and if anie thing affright her, shee presently take's in water, and sink's her self. *Plin. lib.9. cap.29.*

The shape of Nautilos, *or Sailer-fish*

The

How the Whale may be reckoned amongst monsters.

The better to store this Treatise of Monsters, abusing the name with the Poëts, wee will reckon up the whale amongst the Sea-monsters, by reason of his monstrous and wondrous magnitude. Now the Whale is the greatest by much of all the fishes of the Sea, for most commonly this beast is thirtie six cubits long, eight high, the slit of his mouth is eighteen foot long, teeth they have none, but in stead thereof in each Jaw hornie black excrescences or fins [which wee vulgarly term Whale-bones] which by little and little end in small hairs like to a swine's bristles, which comming and standing out of his mouth, are in stead of Guides, lest whilest hee swim's with a blinde and rapid violence, hee might run against a rock. His eies are distant one from the other the space of four ells, which outwardly appear small, but inwardly they are bigger then a man's head; wherefore they are deceived that saie that they are no bigger then an Ox's eies: his nose is short, but in the middle of his fore-head hee hath a pipe whereat hee draw's in the air, and cast's forth a whole shower or river of water, that therewith hee will even sink the vessels or boats of Mariners; when hee hath filled himself beyond measure, hee crie's out or roar's with so great or strong a voice, that hee may bee heard two miles off. Hee hath two verie large fins upon his sides wherewith hee swim's, and under which in the time of danger hee hide's his young; hee hath none upon his back. His tail in site is like to the tails of Dolphins, neither is it much unlike in shape, which when hee moov's, hee so tosseth the Sea, that hee drown's and overturn's the boats that hee toucheth. You may by dissecting them finde that a Whale bring's forth live-young, and give's them suck; for the male hath testicles and a yard, but the female a womb and dugs. They are taken in divers places about winter, but chiefly about the coast of *Aquitane*, at a small town which is vulgarly called *Biarris*, som six miles distant from *Bayon*: whereunto I beeing sent by King *Charls* the ninth when hee was at *Bayon*, to cure the Prince of *Roche Sur-You*, I was an eie-witnesse how they are caught; and also I confirmed that which I had formerly read to that purpose, in that excellent and most true historie of fishes set forth by *Rondeletius*. Now at that town there is a little hill, in the top whereof there is a Tower of verie great antiquitie, from which as from a watch-tower they keep watch whether or no anie Whales swim that waie. Wherefore the watch-men from the tower, either seeing, or by the horrible noise hearing a Whale to pass that waie, they give warning thereof to the inhabitants by the beating of Drums, and ringing a Bell: which sign once given, they all run forthwith, as to extinguish the Cittie if it were on fire, beeing furnished with weapons and all things fitting for that purpose. For the people of that countrie are verie diligent and expert in catching the Whale. Wherefore in each of the boats furnished with all things either to assail or flie, there are put ten lustie rowers, and divers others furnished with harping irons to strike the Whale; which beeing cast and fastned in her, they loose out huge long ropes fastned to them, until such time as hee bee dead, then together with the ropes, and assisted by the waves of the sea, they draw the Whale (wearied with running and laboring, and fainting by reason of the magnitude and multitude of his wounds, beeing in the time of their conflict diligently chased and driven toward the shore) a land; and merrily part the preie, each whereof hath his share, according to the number of the irons thrown, the magnitude of the wound, and the necessitie and excellencie of the wounded part for life: each of their harping-irons are known by their peculiar marks. In the heat of the skirmish manie stand up and down in boats, onely for this purpose, to take up such as chance to fall into the Sea, lest they should bee drowned. The males are caught with more difficultie, the females more easily, especially if their young ones bee with them; for whil'st they linger to help and succour them, they lose the occasion of escaping. The flesh is of no esteem, the tongue onely is commendable; for beeing verie large, and of a verie lax substance, it is poudered, and by most Gentlemen accounted for a daintie. The lard is dispersed over manie countries, to bee boiled and eaten with fish in the time of Lent, that Gourmandizers may have somthing to serv them in stead of flesh which is then forbidden. There is great store of fat in them in the parts under the skin and bellie, which melted, concreet's not again, by reason of the subtiltie of the parts, they keep it to burn in lamps, and to use about their ships. The houses of the fish-eaters are builded with their bones; also orchards in the coast of *Aquitane* are fenced with these bones. The fins that stand forth of their mouths, which are commonly called Whale-bones, beeing dried and polished, serve to make busks for women, whip-staves, and little staves, as also to stiffen garments. Manie make seats or stools of the *vertebræ*, or spondils of the back-bone.

A Whale bring's forth young, and suckle's them.

How they are caught.

Why the females are more easily caught then the males.

Whale-bone.

The

The manner of cutting up the Whale.

In the river *Scalde*, ten miles from *Antwerp*, *Anno Dom.* 1477. the second daie of *Julie*, there was a Whale taken, of a blackish blue color, shee had a spout hole in the top of her head, out of which shee cast great store of water: shee was fiftie eight foot long, and sixteen foot high: her tail was fourteen foot broad; from the eie to the end of her nose was som sixteen foot. Her lower jaw was six foot on each side, shee had twentie five teeth, which shee could hide in her upper jaw, there beeing holes for them, it beeing whollie toothless; for which one thing this Whale may bee judged monstrous, for that nature hath denied them teeth, and and for that in creatures that are not horned, it is so ordained by nature, that when they have teeth in their lower jaw, they should have others also in the upper to answer to them, so to chaw their meat. The longest of these teeth exceed not six inches.

There is (as *Plinie* report's) a verie small fish accustomed to live about rocks, it is called *Echeneis*, never excceeding the length of a foot; it is thought that ships go more slowly if this stick to them: wherefore the Latins have also given it a name of *Remora*, for that a ship beeing under sail with a good winde, may by the *Echeneis* seazing on her as if shee would devour her, bee staied against the Sailer's wills, and stand still as if shee were in a safe harbor. Wherefore shee is said in the Actian fight to have staied the ship of *Marcus Antonius*, hastening to go about and encourage his souldiers, so that hee was forced to enter into another ship, and thereupon *Cesar's* navie came upon them too hastily, and before they were provided. *Lib. 9. cap. 25. & lib. 32. cap. 1* The wondrous power of the *Remora*.

Shee also stai'd the ship of the Emperor *Caius*, comming from *Astura* to *Antes*, his ship of all the navie makeing no waie; neither did they long wonder at this staie, the cause beeing presently known; som forthwith leaping into the Sea to finde the cause thereof, there found her about the ship, even sticking to the Rudder, and they shewed her to *Caius*, beeing wroth that this so small a thing should stop him, and countermand the endevour of fortie Rowers.

Therefore this little fish tame's and infringe's the violence and madness of the world, and that with no labor, not without holding or anie other waie, but onely by sticking thereto. Cetainly how ever it com's to pass, who from this example of holding of ships, can doubt of anie power or effect of nature, in medicines which grow naturally? Yea, and without this example, the *Torpedo* out of the sea also may bee sufficient, who a far off, and at distance, if it bee touched with a spear or rod, will benumb even the strongest arms, and retard the feet, how ever nimble to run away. The wondrous force of the *Torpedo*.

CHAP. XXII.

Of the admirable nature of Birds, and of som Beasts.

THat there bee divers things not onely in the Sea, but also in the air and earth, which by the wonderful condition of their own nature may equal that of Monsters, the onely Estrich may serv for a witness. It is the biggest of Birds, though indeed it partly resemble's a bird, and partly a beast (and it is familiar to *Africa* and *Æthiopia*) as which contrarie to the nature of beasts hath feathers, and against the custom of birds cannot flie aloft; for it hath not feathers fit to flie, but like unto hairs, yet will it out-run a horse. The natural force of the stomach in concocting is miraculous, as to which nothing is untameable: shee laie's eggs of a wondrous largness, so that they may bee framed into cups: their feathers are most beautiful, as you may perceiv by this following figure. The Estrich is between a bird and a beast. The wondrous force of her stomach.

The

The figure of an Estrich.

Anie one may easily gather of what a prodigious magnitude an Estrich is, by the greatness of his bones. three of these birds were kept at the King's charge, by the *Mareschal de Rets:* one whereof dying, it was bestowed upon mee, whereof I have with great diligence made a *Sceleton.*

The delineation of the Sceleton *of an Estrich.*

A. Shew's the head, which was somwhat thicker then the head of a Crane, of the length of one's hand, plain from the crown even to the beak; the beak being divided to the middle region of the eie, beeing roundish at the end thereof.

B. The

B. The neck, a yard long, consisting of seventeen *vertebræ*'s, each whereof on each side is furnished with a transverse process looking downwards, of som fingers length, excepting the two which are next the head, as which want these, and are joined together by *Ginglymos*.

C. The back is of a foot's length, consisting of seven *Vertebræ*.

D. The holie-bone of two foot long, in whose top there is a transverse process, under which there lie's a great hole.

E. Three more, but less.

F. G. H. After which there follow's the cavitie or socket, whereinto the head of the thigh-bone is received and hid. This externally and on the side produceth a perforated bone, noted with the letter *I.* perforated I saie at the beginning, for it is presently united at the letter, *K.* then is it forked and divided into two other bones, whereof one is bigger then the other. The less is noted with the letter, *L.* then are they both united at the letter *M.* each of them is half a foot and four inches long. But from that part whereas they first begun to bee divided, to that whereas they are united, there is a hole som four fingers broad, but the length of one's hand, or more, and it is noted with the letter *N.* The residue of the bone is like to a pruning knife three inches broad, but six in length: at the end whereunder is the letter, *O.* it is joined by coalition.

P. The rump consisting of nine *vertebræ*'s, like to a man's. The thigh-bones are two, whereof that which is noted with the letter *Q.* is of the length of a foot, and of thickness equal to a horse's thigh. The other next under (which peradventure you may call the leg-bone) noted with *R.* is a foot and half long: it hath joined thereto the *Fibula*, or lesser focil of the length, but which grow's smaller as it com's lower.

S. Is the leg, to which the foot adhere's, being one foot and a half long, divided at the end into two claws, the one bigger, the other less, whereof each consist's of three bones.

T. Eight ribs, which are inserted into the *Sternon*, the three middlemost of these have a bonie production like to a hook.

V. Is the *Sternon*, consisting of one bone of som foot's length, representing a buckler, to this there is joined another bone, which stretched over the three first ribs, is in stead of clavicles or collar-bones.

X. The first bone of the wing, which is one foot and half long.

Y. Two bones under this, equivalent to the ell and wand, under which there are six other bones composing the point of the wing, noted with *Z*.

This whole *Sceleton* is seven foot long, and so manie foot or more high from the feet to the beak: there are manie other observable things in his composure, but I have thought fit to omitt them for brevitie's sake.

Jerom Cardane in his books *De subtilitate*, write's, that in the Ilands of the *Molucca*'s you may somtimes finde lying upon the ground, or take up in the waters, a dead bird called a *Manucodiata*, that is in Hebrew, the bird of God, it is never seen alive. It live's aloft in the air, it is like a Swallow in bodie and beak, yet distinguished with divers colored feathers: for those on the top of the head are of a golden color, those of the neck like to a Mallard, but the tail and wings like Peacocks; * it want's feet: Wherefore if it becom wearie with flying, or desire sleep, it hang's up the bodie by twineing the feathers about som bough of a tree. It passeth through the air, wherein it must remain as long as it live's, with great celeritie, and live's by the air and dew onely. The cock hath a cavitie depress in the back, wherein the hen laie's and sit's upon her eggs. I saw one at *Paris* which was presented to King *Charls* the ninth.

The description of the bird of Paradise.

The effigies of a Manucodiata, *or bird of Paradise.*

* Whosoever desire's to know more of the truth of this bird, let him read *Clusius* in the *Auctarium ad lib.* 5 *cap.* 1. *exoticorum.*

Wee have read in *Thevet's* Cosmographie, that hee saw a bird in *America*, which in that countrie speech is called *Touca*, in this verie monstrous and deformed, for that the beak in length and thickness, exceed's the bigness of the rest of the bodie; it feed's on pepper, as the black-birds and felfares with us do upon Ivie-berries, which are not less hot then pepper. *Tom. 2. l. 21. cap. 12.*

A cer-

A certain Gentleman of *Provence* brought a bird of this kinde from that countrie, to preſent it to King *Charls* the ninth, but dying in the waie hee could not preſent it alive. Wherefore the King wiſhed the *Mareſchal de Rets* to give her to mee, that I might take forth her bowels and embalm her, that ſhee might bee kept amongſt the King's rarities. I did what I could, yet not long after ſhee rotted: ſhee reſembled a crow in bodie and feathers, but had a yellowiſh beak, clear, ſmooth, and toothed like a ſaw, and of ſuch length and thickneſs as wee formerly mentioned. I keep it yet as a certain monſtrous thing.

Tom. 1. cap. 11. lib. 4. *Thevet* write's, that in the Iſland *Zocotera* there is frequently found a certain wilde beaſt called *Hulpalis*, of the the bigneſs of an Ethiopian Monkie. It is a verie monſtrous creature, but in nothing more, then that it is thought to live upon the air onely; the skin, as if it were died in grain, is of a ſcarlet color, yet it is in ſom places ſpotted and variegated: it hath a round-head like to a boul, with feet round, broad, and wanting hurtful nails. The Moors kill it and uſe to eat the fleſh of it, beeing firſt bruiſed, that ſo it may bee the more tender.

Thevet tom 1. lib. 11. cap. 13. In the Realm of *Camota*, of *Abob*, of *Benga*, and other mountains of *Cangipa*, *Plimatiq* and *Catagan*, which are in the inner *India*, beyond the river of *Ganges*, ſom five degrees beyond the Tropick of *Cancer*, is found a beaſt, which the Weſtern German's call Giraff. This beaſt in head, ears, and cloven feet, is not much unlike our Do; it hath a verie ſlender neck, but it is ſom ſix foot long, and there are few beaſts that exceed him in the length of their legs: his tail is round, but reacheth no further then his hams; his skin is exceeding beautiful, yet ſomwhat rough, having hair thereon ſomwhat longer then a Cow, it is ſpotted and variegated in ſom places with ſpots of a middle color, between white and cheſnut, ſo as Leopards are: for which cauſ by ſom Greek Hiſtorians it is called a *Cameleopardalis*: it is ſo wilde before it bee taken, that with the good-will it will not ſo much as bee ſeen. Therefore it inhabite's and live's onely in deſert and ſecret places, unknown to the reſt of the beaſts of that region. Hee preſently flie's away at the ſight of a man, yet is hee taken at length, for that hee is not verie ſpeedie in running away; once taken, hee is as eaſily and ſpeedily tamed as anie wilde beaſt whatſoever. Hee hath above his crown two ſtraight horns covered with hairs, and of a foot's length. When as hee hold's up his head and neck hee is as high as a Lance. Hee feed's upon herbs and the leavs and boughs of trees; yea, hee is alſo delighted with bread.

The effigies of Giraffa.

Such

Such as sail in the red sea along the coast of *Arabia*, meet with an Iland called by the *Arabians Cademota*; in that part thereof where the river *Plata* run's, is found a wilde beast, called by the barbarous inhabitants *Parassopi*, beeing of the bigness of a Mule, headed not unlike one, yet rough and haired like to a Bear, but not of so dark a color, but inclineing to yellow, with cloven feet like a Hart: shee hath two long horns on her head, but not branched, somwhat resembling those so much magnified horns of Unicorns. For the native's of the place, bitten by the venemous tooth of either beast or fish, are presently helped and recover by drinking the water wherein such horns have been infused for six or seven daies space, as *Thevet* in his Cosmographie report's.

In one of the Islands of the *Molucca's* there is found a beast living both on land and water like as a Crocodile; it is called *Camphureb*, it is of the bigness of an Hart, it hath one horn in the fore-head, moovable after the fashion of the nose of a Turkie-cock: it is som three foot and an half long, and never thicker then a man's arm; his neck is covered over with an ash color, hee hath two feet like to a goos's feet, wherewith hee swim's both in fresh and salt waters. His fore-feet are like to a stag's, hee live's upon fish. Manie have perswaded themselvs that this beast is a kinde of Unicorn, and that therefore his horn should bee good against poisons. The King of the Island love's to bee called by the name of this beast; and so also other Kings take to themselvs the names of the wilde beasts, fishes, or fruits, that are most precious and observable in their dominions, as *Thevet* report's.

Mauritania and *Æthiopia*, and that part of *Africk* that is beyond the deserts and syrtes, bring forth Elephants; but those of *India* are far larger. Now although in the largeness of their bodie they exceed all four-footed beasts, yet may they bee more speedily and easily tamed then other beasts. For they may bee taught to do manie things above the common nature of beasts. Their skin is somwhat like to a Buffles, with little hair upon it, but that which is, is ash colored, his head large, his neck short, his ears two handfuls broad, his nose or trunk verie long, ahd hanging down almost to the ground, hollow like as a trumpet, the which hee useth in stead of an hand, his mouth is not far from his breast, not much unlike a swine's, from the upper part whereof two large teeth thrust forth themselvs, his legs are thick and strong, not consisting of one bone as manie formerly have falsly beleeved (for they kneel to admit their Rider, or to bee laden, and then rise up again of themselvs) his feet are round like a quoit som two or three hand's bredth, and divided into five clefts. Hee hath a tail like a Buffle, but not verie rough, som three hand's bredth long, wherefore they would bee much troubled with flies and wasps, but that nature hath recompenced the shortness of their tails by another waie; for when they finde themselvs molested, they contract their skin so strongly, that they suffocate and kill these little creatures taken in the wrinkles thereof; they over-take a man running by going only, for his legs are proportionable to the rest of his bodie.

The Indian Elephants are bigger then the African.

How they keep flies from them.

They feed upon the leavs and fruits of trees, neither is anie tree so strong or well rooted, which they cannot throw down and break. They grow to bee sixteen handfuls high, wherefore such as ride upon an Elephant are much troubled as if they went to sea. They are of so unbridled a nature, that they cannot endure anie head-stall or reins, therefore you must suffer them to take the cours and waie they pleas. Yet do they obey their countrie-men without anie great trouble; for they seem after som sort to understand their speech, wherefore they are easily governed by their known voices and words. They throw down a man that anger's them, first taking him up with their trunk and lifting him aloft, and then letting him fall, they thread him under foot, and leav him not before hee bee dead. *Aristotle* write's that Elephants generate not before they bee twentie years old: they know not adulterie, neither touch they anie female but one, from which they also diligently abstain when they know shee hath once conceived. It cannot bee known how long they go with young, the reason is for that their copulation is not seen, for they never do it but in secret. The females bring forth resting upon their hinde legs, and with pain like women, they lick their young, and these presently see and go, and suck with their mouths, and not with their trunks. You may see Elephant's teeth of a monstrous and stupendious bigness, at *Venice*, *Rome*, *Naples*, and *Paris*; they term it Ivorie, and it is used for Cabinets, Harps, Combs, and other such like uses.

Lib. 9. de hist. anim. cap. 18.

It is not known how long an Elephant go's with young.

The figure of an Elephant.

Wee have read in *Thevet*, that in *Florida* there are great Bulls, called in that countrie tongue *Beaurrol*, they have horns of a foot long, a bunch on their back like a Camel, their hair long and yellow, the tail of a Lion; there is scarce anie creature more fierce or wilde, for it can never bee tamed, unless it bee taken from the dam. The Salvages use their hides against the cold, and their horns as an Antidote against poison. *Tom. 2. lib. 23. cap. 2.* Their horns good against poison.

The same author affirm's that whilest hee sailed in the red sea, hee saw a monster in the hands of certain Indian merchants, which in the bigness and shape of his limbs was not unlike a Tiger, yet had the face of a man, but a verie flat nose: besides, his fore feet were like a man's hands, but the hinde like the feet of a Tigre, hee had no tail, hee was of a dun color: to conclude, in head, ears, neck, and face it resembled a man, but in the blackish and curled hair, a Moor: for the other parts they were like a Tigre; they called it *Thanafth*. *Tom. 1. lib. 2. cap. 10.*

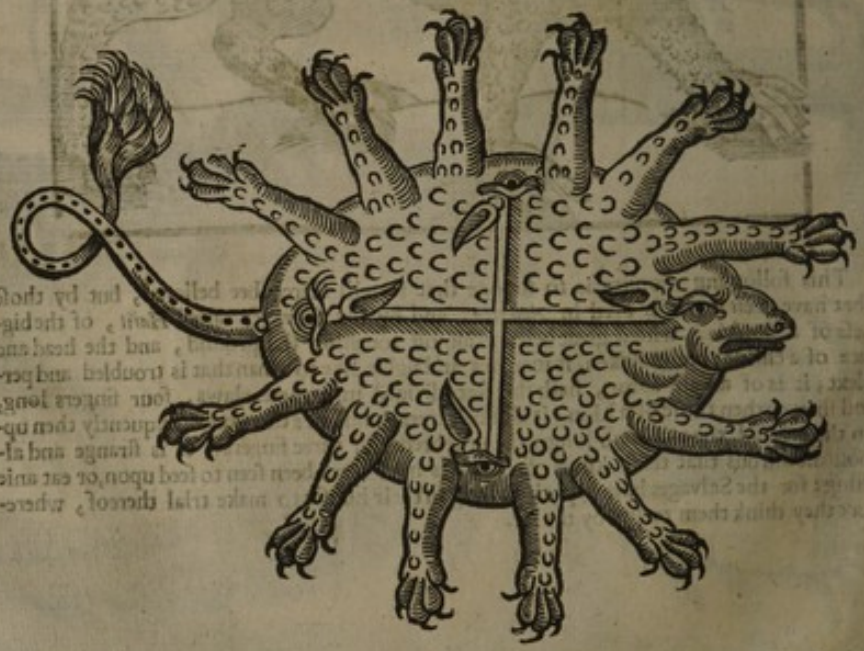
The figure of a beast called Thanafth.

This following monster is so strange that it will scarce bee believed, but by those that have seen it: it is bred in *America*, and by the Salvages called *Haitt*, of the bigness of a Monkie, with a great bellie, almost touching the ground, and the head and face of a childe: beeing taken, it mourn's and sigh's like to a man that is troubled and perplext; it is of an ash-color, hath the feet divided into three claws, four fingers long, and sharper then those of a Lion: it climbe's trees, and live's there more frequently then upon the ground, the tail is no longer then the bredth of three fingers. It is strange and almost monstrous that these kinde of creatures have never been seen to feed upon, or eat anie thing: for the Salvages have kept them long in their houses to make trial thereof, wherefore they think them to live by the air.

The figure of the beast called Haiit.

I have taken this following monster out of *Leo*'s African historie; it is verie deformed, being round after the manner of a Tortois, two yellow lines crossing each other at right angles, divide his back; at everie end of which hee hath one eie, and also one ear, so that such a creature may see on everie side with his four eies, as also hear by his so manie ears: yet hath hee but one mouth, and one bellie to contain his meat, but his round bodie is encompassed with manie feet, by whose help hee can go anie waie hee pleas without turning of his bodie, his tail is something long and verie hairie at the end The inhabitants affirm, that his blood is more effectuall in healing of wounds then anie balsom.

Blood as good as balsom.



It is strange that the *Rhinoceros* should bee a born enemie to the Elephant; wherefore hee whet's his horn, which grow's upon his nose, upon the rocks, and so prepare's himself for fight, wherein hee chiefly assails the bellie, as that which hee know's to bee the softest: hee is as long as an Elephant, but his legs are much shorter, hee is of the color of box, yet somwhat spotted. *Pompie* was the first, that shewed one at *Rome*.

Plin. l. 8. c. 29.

The

The figure of the Chameleon.

Plin lib. 8. c. 33. *Africa* produceth the *Chameleon*, yet is it more frequent in *India*: hee is in shape and greatnes like a Lizard, but that his legs are straight and higher, his sides are joined to the bellie as in fish, and his back *Arist. lib. 2. hist. anim. cap. 12.* stand's up after the same manner, his nose stand's out not much unlike a swine's, his tail is long, and endeth sharp, and hee fould's it up in a round, like a serpent, his nails are crooked, his pace slow like as the Tortois, his bodie rough, hee never shut's his eies, neither doth hee look about by the mooving of the apple, but by the turning of the whole eie. The nature of his color is verie wonderful, for hee changeth it now and then in his eies and tail, and whole bodie beside; and hee alwaies assimilate's that which hee is next to, unless it bee red or white. His skin is verie thin, and his bodie clear; therefore the one of these two, either the color of the neighbouring things in so great subtiltie of his clear skin, easily shine's as in a glass; or elss various humors diversly stirred up in him, according to the varietie of his affections, represent divers colors in his skin, as a Turkie-cock doth in those fleshie excrescences under his throat, and upon his head: hee is pale when hee is dead. *Mathiolus* write's that the right eie taken from a living *Chameleon* take's away the white spots which are about the thornie coat of the eie; his bodie being beaten, and mixed with Goat's milk, and rubbed upon anie part, fetcheth off hairs; his gall discusseth the Cataracts of the eie.

The strange nature of the color of the Chameleon.

CHAP. XXIII.

Of Celestial Monsters.

PEradventure it hath not been strange that monsters have been generated upon the earth and in the Sea: but for monsters to appear in heaven, and in the upper region of the air, exceed's all admiration. Yet have wee often read it written by the antients, that the face of heaven hath been deformed, by bearded, tailed, and haired Comets; by meteors representing burning torches, and lamps, pillars, darts, shields, troups of clouds, hostilely assailing each other; Dragons, two Moons, Suns, and the like monsters and prodigies. An-

The figure of a fearful Comet.

Antiquitie hath not seen anie thing more prodigious then that Comet which appeared with bloodie hair in *Uverstine*, upon the ninth daie of *October*, 1528, for it was so horrible and fearful a spectacle, that divers died with fear, and manie fell into grievous diseases; going from the East to the South, it endured no longer then one hour and a quarter: in the top whereof was seen a bending arm holding a great sword in a threat'ning hand; at the end thereof appeared three stars, but that over which the point of the sword directly hanged was more bright and clear then the rest: on each side of this Comet were seen manie spears, swords, and other kindes of weapons died with blood, which were intermixt with men's heads, haveing long and terrible hair and beards, as you may see in this figure.

Also there have been seen great and thick bars of Iron to have faln from heaven, which have presently been turned into swords and rapiers. At *Sugolia* in the borders of *Hungaria*, a stone fell from heaven with a great noise, the seventh daie of *September*, *Anno Dom.* 1514. it weighed two hundred and fiftie pound: the Citizens hanged it up with a great iron-chain put through it, in the mid'st of the Church of their Cittie, and used to shew it, as a miracle, to travellers of better note that pass'd that waie. *Plinie* report's that clashing of armour, and the sound of a trumpet were heard from heaven often, before and after the Cimbrian war. The same author write's that in the third Consul-ship of *Marius*, the *Amarines* and *Tudortines* saw the heavenlie armies comming from East and West; and so joining, those being vanquished which came from the East. Which same thing was seen in *Lusalia*, at a town called *Jubea*, two hours after mid-night, *A Dom.* 1535. But in *A.Dom.* 1550. upon the 19. daie of *Julie*, in *Saxonie*, not far from *Wittenburg*, there appeared in the air a great Stag, incompassed with two armed hosts, makeing a great noise in their conflict, and at the same instant it rained blood in great abundance, the sun seemed to bee cloven in two pieces, and the one of them to fall upon the earth. A little before the takeing of *Constantinople* from the Christians, there appeared a great armie in the air appointed to fight, attended on with a great companie of dogs and other wild beasts. *Julius Obsequius* report's that in *A.Dom.* 458. it rained flesh in *Italie*, in greater and lesser pieces, part of which were devoured by the birds before they fell upon the earth: that which fell upon the earth kept long unputrefied, and unchanged in color and smel. *A.Dom.* 989. *Otho* the third being Emperor, it rained corn in *Italie*. *A.D.* 180. it rained milk and oil in great abundance, and fruit-bearing trees brought forth corn. *Lycosthenes* tel's that in the time of *Charls* the fifth, whil'st *Maidenberg* was besieged, three suns first appeared about 7. a clock in the morning, and then were seen for a whole daie whereof the middlemost was the brightest, the two others were reddish, and of a bloodie color; but in the night time there appeared three Moons. The same appeared in *Bavaria*, *An. Dom.* 1554.

L.2. c.57.

Presages of the takeing of *Const antinople.*

Monstrous rains.

But if so prodigious and strange things happen in the heavens besides the common order of nature, shall we think it incredible that the like may happen in the earth? *An. Dom.* 542. the whole earth quaked, mount *Ætna* cast forth flames and sparks of fire, with which manie houses of the neighbouring villages were burn'd. *An. Dom.* 1531. in *Portugal* there was an earthquake for eight daies, and it quaked seven or eight times each daie; so that in *Lisbone* alone it cast down a thousand and fiftie houses, and more then six hundred were spoiled. *Ferrara* lately was almost wholly demolish'd by a fearful earthquake. Above all which ever have been heard is that prodigie which happened in the time of *Plinie*, at the death of *Nero* the Emperor in the *Marucine* field, the whole Olive-field of *Vectius Marcellus* a Romane Knight going over the high waie, and the fields which were against it comming into the place thereof. Why should I mention the miracles of waters, from whose depth and streams, fires and great flames have oft broke forth? They tell out of St. *Augustine*, that the fire of the sacrifice, which for those seventie years of the Babylonian captivitie endured under the water, was extinguished, *Antiochus* selling the priest-hood to *Jason*. What miracle is this, that the fire should live in the water, above its force and natural efficacie, and that the water should forget the extinguishing facultie! Verily Philosophers truely affirm that the elements, which are understood to be contrarie, and to fight in varietie among themselvs, are mutually joyned and tied together by a marvellous confederacie.

Earthquakes.

Lib.2. cap.73.

The end of the Twentie fifth Book.

OF THE Faculties of Simple MEDICINES, AS ALSO Of their Compoſition and Uſe.

The Twentie ſixth Book.

The PREFACE.

The excellencie of medicines.

AMongſt the cauſſes which wee term healthful, and other remedies which pertain to the health of man, and the expelling of Diſeaſes, Medicines eaſily challenge the prime place; which (as it is delivered by Solomon) God hath produced out of the earth, and they are not to bee abhorred by a wiſe man; for there is nothing in the world, w ich ſooner, and as by a miracle, aſſwageth the horrid torments of diſeaſes. Therefore Herophilus called them fittingly adminiſtred, The hands of the Gods. And hence it was that ſuch Phyſicians as excelled in the knowledg of Medicines, have amongſt the Antients acquired an opinion of Divinitie. It cannot by words bee expreſſed what power they have in healing. Wherefore the knowledg of them is verie neceſſarie not onely for the prevention, but alſo for the driveing away of Diſeaſes.

CHAP. I.

What a medicine is, and how it differeth from nouriſhment

WEE define a medicine to bee, That which hath power to change the bodie according to one or more qualities; and that ſuch as cannot bee changed into our nature: contrarie whereto wee term that nouriſhment which may bee converted into the ſubſtance of our bodies. But wee define them by the word *power*, becauſ they have not an abſolute nature, but as by relation and depending upon the condition of the bodies by whom they are taken. For that which is medicine to one, is meat to another, and that which is meat to this, is medicine to that. Thus for example, Hellebore is nouriſhment to the Quail, but a medicine to man: Hemlock is nouriſhment to a Sterling, but poiſon to a Goos: the *Ferula* is food to an Aſs, but poiſon to other cattel. Now this diverſitie is to bee attributed to the different natures of creatures.

It is recorded in hiſtorie, that the ſame by long uſe may happen in men. They report that a maid was preſented to *Alexander* the Great, who nouriſhed with *Napellus*, and other poiſons, had by long uſe made them familiar to her, ſo that the verie breath ſhee breathed was deadlie to the by-ſtanders. Therefore it ought to ſeem no marvail, if at anie time it happen, that medicines turn into the nature and nouriſhment of our bodies: for wee commonly may ſee birds and ſwine feed upon ſerpents and toads without anie harm: and laſtly,

——Serpenti Ciconia pullos
Nutrit, & per devia rura lacerta:
Illi eadem ſumptis quærunt animalia pennis.

The Stork with Serpents and with Lizards caught,
In waieleſs places nouriſheth her brood:
And they the ſame purſue, when as they 're taught
To uſe their wing, to get their wiſh'd-for food.

CHAP. II.

The differences of Medicines in their matter and ſubſtance.

The earth the mother of riches and medicines

EVen as the concealed glorie of worldlie riches lieth hid in the bowels of the earth, and depths of the ſea and waters, as gold, ſilver and all ſorts of metals, gemms and pretious ſtones, furniſh'd with admirable virtues; ſo wee may behold the ſuperficies of this earth clothed with almoſt an infinite varietie of trees, ſhrubs, and herbs: where wee may contemplate and wonder at the innumerable diverſities of roots, leavs, flowers, fruits, gums, their ſmels, pleaſant taſts and colors, but much more at their virtues. This ſame mother-earth, as with her breaſts, nouriſheth marvellous diſtinct kindes of liveing creatures, various in their ſpringing, encreaſ and ſtrength. Wherein the immenſ goodneſs of God, the great Architect and framer of all things, doth moſt clearly appear towards man, as who hath ſubjected to our government, as a patrimonie, ſo ample and plentiful proviſion of nature for our delight in nouriſhment and neceſſitie of healing. Therefore the antient Phyſicians have right-

rightly delivered, that all ſorts of medicines may bee abundantly had from liveing creatures, plants, the earth, water and air.

What medicines taken from liveing creatures.

Medicines are taken from liveing creatures either whole and entire, or elſ the parts and excrements of them. Wee ofttimes uſe in Phyſick whole creatures, as foxes, whelps, hedg-hogs, frogs, ſnails, worms, crabs, and other living creatures. Wee alſo make uſe of ſom parts of them, as the liver of a Wolf or Goat, the lungs of the fox, the bone of the ſtags heart, *Cranium humanum*, fat, blood, fleſh, marrow, the cods of the *Caſtor* or Beaver, which, is therefore termed *Caſtoreum*, and ſuch other particles that are uſeful in Phyſick. Wee know alſo that there are ſom medicines taken from excrements, as horns, nails, hairs, feathers, skin; as alſo from urine, dung, ſpittle, honie, eggs, wax, milk, wool, ſweat, and others of this kinde, under which wee may comprehend muſk, civet, pearl, *æſipus*, and ſundrie others of this nature.

What from plants.

Wee take medicines from plants, both whole, and alſo from their parts, whether trees, ſhrubs, or herbs. For we oft-times uſe ſuccorie, marſh-mallows, mallows, plantain, and the like, whole: but otherwhiles onely the roots of plants, their pith, wood, bark, ſhoots, ſtalks, leavs, flowers, ſeeds, fruits, juices, gums, roſines, moſſes, and the like.

What from the earth.

Things taken from the earth for the uſe and matter of medicine, are either earths, ſtones, or Minerals. The ſorts of earth are Bole-Armenick, *Terra ſigillata*, fuller's-earth, chalk, potters claie, and ſuch like. Stones, are the pumice, Marchiſite of gold, ſilver, braſs, marble, the load-ſtone, plaiſter, chalk, *ſulphur vivum*, *lapis ſpecularis*, and others. Metals and Minerals are gold, ſilver, tin, lead, braſs, iron, ſteel, antimonie, ceruſe, brimſtone, Cinnaber, litharge of gold and ſilver, tuttie, true *Pompholix*, verdigreece, alum, romane vitriol, copras white and green, ſalts of ſundrie kinds, both of Arſenicks, and ſuch like.

What from the water.

The following medicines are from freſh water, rain-water, ſpring-water, river-water, and all things thence ariſeing, as water-lentile, common flags, water-lilies, water-mints, and all the creatures that live therein. From the ſalt-water are taken ſalt, *Alcyonium*, all ſorts of coral, ſhels of fiſh, as alſo cuttle-bones, ſponges, and all creatures of the ſea. From waters mixt of ſalt and freſh, the herb *Androſace* (which grow's in plentie in the marſhes at *Fontignan* and *Cape de Sete*) *Aſphaltum*, which is found in the dead ſea.

What from the air.

From the air proceed's *Manna*, therefore called *mel-aërium* (*i. e.*) honie of the air, and alſo all other kindes of dew that are uſeful in Phyſick, by reaſon of the virtues they receiv from the ſun which raiſeth them up; from the air, whereas they make ſom ſtaie; as alſo from the plants, whereupon they fall and reſide.

CHAP. III.

The differences of ſimples in their qualities and effects.

ALL the mentioned ſorts of ſimples are indued with one or more of the four faculties, whereof I now purpoſe to treat.

The firſt faculte common to all the reſt, and as it were their foundation, flow's from the four firſt qualities of the prime bodies or elements, that is heat, coldneſs, drineſs, and moiſture, and this either ſimple or compound, as one or two of theſe prime qualities exceed in the temper of the medicine, as may appear by this following.

The *ſimple* qualitie is either to Heat, Cool, Humect, Drie.

The *compound*, ariſeing from two joined qualities, either Heat's and drie's, Heat's and moiſten's, Cool's and drie's, Cool's and moiſten's.

Heat moderate, Heat's, Attenuate's, Rarifie's, Open's the paſſages, Digeſt's, Suppurate's. Immoderate, Inflame's and burn's, Bite's, whence follow's Violent attraction, Rubrification, Conſumption, Colliquation, An eſchar, Mortification.

Cold moderate, Cooleth, Condenſeth, Obſtructeth. Immoderate, Congeal's, Stupifie's, Mortifie's.

Moiſture moderate. Humect's, Lubricate's, Levigate's and mitigate's, Glue's. Immoderate, Obſtruct's, lift's up into a flatulent tumor, eſpecially if it bee a vaporous humiditie.

Drineſs moderate, Drie's, Rarifie's, Attenuate's. Immoderate, Binde's, Contract's or ſhrink's, Cauſeth chops and ſcails.

The effect of theſe qualities is diſtinguiſhed, and as *Galen* obſerv's digeſted into theſe orders, which wee term Degrees, ſo that by a certain proportion and meaſure, they may ſerv to oppugn diſeaſes, as the ſame *Galen* affirm's. For to a diſeaſ (for example) hot in the ſecond degree, no other medicine muſt bee uſed then that which is cold in the like degree: Wherefore all ſimple medicines are Hot, Cold, Moiſt, or Drie; in the beginning, middle, or extreme, of the firſt, ſecond, third, or fourth degree. *c. ſimp. & 1. de aliment.*

The Heat, Coldneſs, Moiſture, Drineſs, of the firſt, ſecond, third, fourth degree; is either Obſcure, Manifeſt, Vehement or Exceſſive.

An

Examples of the degrees of heat.

An example of heat distinguished thus by degrees, may bee thus; Warm water is temperate; that which is a little hotter, is in the first degree of heat; if manifestly hot, it is in the second degree; but if it heat more vehemently, it may bee thought to com to the third; but if it scald, then wee know that it hath arrived to the fourth degree of heat. Such also is the distinction of coldness, moisture, and drinesse by degrees. Wherefore it will bee worth our labor, to give you examples of certain medicines, distinguished in their order and degree, by which you may the more easily give conjecture of the rest.

Simple Medicines hot in the

First degree. *Absinthium. Alibæa. Amygdala dulcia. Beta. Brassica. Chamæmelum. Ladanum. Semen Lini. Saccarum. Ervum, sive Orobus. Vinum novum:* Forold is judged hot in the second or third degree, as it is more or less years old.

Second degree. *Ammoniacum. Arthemisia. Anethum. Fœnugræcum. Mastiche. Salvia. Marrubium. Melissa. Apium. Chamæpytis. Crocus. Ficus. Thus. Myrrha. Mel. Nux moschata. Pix utraque tum arida corporibus particulisque solidioribus aptior, tum liquida delicatioribus. Scilla. Sarcocolla. Bryonia. Sal. Opopanax. Ammi.*

Third degree. *Abrotanum. Agnus castus. Anisum. Asarum. Aristolochia. Chamædrys. Sabina. Calamintha. Cinnamomum. Iris. Juniperus. Hyssopus. Origanum. Sagapenum. Chelidonium majus. Ruta saliva.*

Fourth degree. *Allium. Cæpa. Euphorbium. Nasturtium. Pyrethrum. Sinapi. Tithymalli. Anacardi. Chelidonium minus, Galeno.* Yet ours, by reason of the gentleness of the air, and moisture of our soil, is not so acrid. *Ruta sylvestris.* This, as all wilde and not cultivated things, becom's more strong and acrid then the Garden-Rue.

Simples cold in the

First degree. *Atriplex. Hordeum. Cydonia mala. Malva. Pyra. Pruna. Rosa. Viola.*

Second degree. *Acacia. Cucurbita. Cucumis. Mala granata acida, dulcia enim temperata sunt potius. Plantago. Polyganum. Solanum hortense; nam id quod somniferum dicitur, vi refrigerandi ad papaver accedit.*

Third degree. *Hyoscyamus. Solanum somniferum. Portulaca. Sempervivum. Mandragora.*

Fourth degree. *Cicuta. Papaveris genera omnia, excepto Corniculato; huic enim incidendi & abstergendi vim attribuit Gal. Certè nitrosum & salsum gustu percipitur, quò fit ut calidæ & siccæ sit naturæ. Opium.*

Simples moist in the

First degree. *Buglossum. Viola. Malva. Rapum. Spinacia.*

Second degree. *Ammoniacum. Lactuca. Cucurbita. Cucumis. Melones. Portulaca.*

Simples drie in the

First degree. *Thus. Chamæmelum. Brassica. Sarcocolla. Crocus. Faba. Fœnugræcum. Hordeum integrum.*

Second degree. *Artemisia. Pix arida. Orobus. Plantago. Balaustia. Nux moschata. Lens Mastiche. Mel. Sal. Anethum. Myrrha.*

Third degree. *Abrotonum ustum. Absinthium. Myrtus. Acetum. Aloe. Milium. Cuminum. Sanguis draconis. Galla. Sabina.*

Fourth degree. *Piper. Allium. Nasturtium. Sinapi. Euphorbium.*

The effects of the first qualities by accident.

Those wee have mentioned have of themselvs and their own nature all such qualities; yet do they produce far other effects by accident, and besides their own nature in our bodies, by reason of which they are termed accidental causses. This shall bee made manifest by the following examples.

External heat by accident refrigerate's the bodie within, becaus it open's the passages and pores, and call's for the internal heat, together with the spirits and humors by sweats: whence it follow's, that the digestion is worse, and the appetite is diminished. The same encompassing heat also humect's by accident, whilest it diffuse's the humors concrete with cold: for thus Venerie is thought to humect.

The like may bee said of Cold, for that it heat's, not by it's proper and native, but by an adventitious force: whereof you may make trial in Winter, when as the ambient cold, by shutting the pores of the bodie, hinder's the breathing forth and dissipation of the native heat. Whence it is inwardly doubled, and the concoction better performed, and the appetite strengthned. This same Cold also drie's by accident, when as it by accident repercusse's the humor that was readie to flow down into anie part, and whil'st it concrete's that which is gathered in the part: for thus, by the immoderate use of repercussers, an œdematous tumor proceeding from gross and viscid phlegm, degenerate's into a *scirrhus*.

Drinesse and Moisture, becaus they are more passive qualities, shew their effects by not so manifest operations, as heat and cold do; but in comparison of them they are rather to bee judged as matter, or a subject.

CHAP. IV.

Of the second faculties of Medicines.

WEE term those the second faculties of Medicines, which have dependance upon the first, which are formerly mentioned, as it is the part of *Heat* to Rarifie, Attract, Open, Attenuate,

Attenuate, Levigate, Cleanſ. Of *Cold*, to Condenſ, Repercuſs, Shut up, Incraſſate, Exaſperate, Conſtipate. Of *Moiſture*, to Soften, Relax. Of *Drineſs*, to Harden. Stiffen.

Hence wee term that an attractive medicine, which hath an attractive facultie, as on the contrarie, that a repercuſſive, that repel's; a detergent, that which cleanſes viſcous matter. Wee call that an Emplaſtick medicine, which not onely ſhut's up the pores of the bodie, but reduce's the liquid bodies therein contained to a certain equalitie and ſubſtance. Thus alſo emollients, relaxers, and the reſt, have their denominations from their effects, as wee ſhall declare hereafter.

CHAP. V.

Of the third faculties of Medicines.

THe third facultie of medicines depend's for the moſt part upon the firſt and ſecond faculties, ſomtimes conjoined, otherwhiles ſeparate. Alſo ſomtimes it follow's neither of theſe faculties, but a certain propertie and inexplicable qualitie, which is onely known by experience. Now the operations of this third facultie are to agglutinate, to fill with fleſh, to cicatrize, to aſſwage pain, to moov or ſtaie the urine, milk, ſeed, the courſes, ſweats, vomits, and perform ſuch like operations in, or about the bodie.

Thus the generation of fleſh is produced by the concourſ of two faculties, that is, of drying and cleanſing. But drineſs and aſtriction produce a glutinating and cicatrizing facultie. A hot and attenuating facultie cauſſeth ſweats, moov's urine, the courſes, and the like in the bodie; but contrarie faculties retard and ſtop the ſame.

To mitigate pain, proceeds' onely from the firſt facultie, to wit, from heat, or a moderately heating facultie; to procure reſt, from cold onely, or coldneſs joined with ſom moiſture. But to procure vomit, proceed's neither from the firſt nor ſecond facultie, but from a certain occult and eſſential propertie, which is naturally implanted in Agarick, and other nauſeous and vomitorie medicines.

CHAP. VI.

Of the fourth facultie of Medicines.

THe fourth facultie of medicines is not of the ſame condition with thoſe that are formerly mentioned; for it depend's not upon them, or anie other manifeſt or elementarie qualitie, but on an occult propertie of the whole ſubſtance; by means whereof, it work's rather upon this then that part, upon this rather then that humor. Wherefore Phyſicians cannot by anie reaſon finde out this facultie, but onely by experience, as wee have ſaid a little before of medicines procuring vomit. Hence it is, that names are given to thoſe medicines from thoſe parts that they chiefly reſpect: For they are termed Cephalicks, which reſpect the head; as, Betonie, Marjarom, Sage, Roſemarie, *Stechas*. Pneumonicks, which reſpect the Lungs: as, Liquorice, ſweet Almonds, Orris, Elecampane. Cordials, that ſtrengthen the heart: as, as Saffron, Cinnamom, Citrons; but chiefly their rindes, Bugloſs, Coral, Ivorie. Stomatical, which reſpect the ſtomach, and the oriſice thereof: as, Nutmegs, Mint, Aniſ, Maſtick, Pepper, Ginger. Hepaticks, which reſpect the Liver: as, Wormwood, Agrimonie, Spiknard, Succorie, Sanders. Splenetick, which have relation to the ſpleen: as, as Time, *Epithymum*, Broom flowers. Cetrach, Capers, the bark of their roots, the bark of Tamariſk. Diureticks, ſuch as reſpect the kidnies and urinarie paſſages: as, the roots of Smallage, Aſperagus, Fennel, Butcher's broom, the four greater cold ſeeds, Turpentine, Plantain, Saxifrage. Arthniticks, or ſuch as ſtrengthen the joints: as Cowſlips, *Chamepytis*, Elecampane, Calamint, Hermodactils, and the like.

The fourth facultie of medicines depend's onely upon an occult propertie.

To this rank may bee referred purging medicines, which, furniſhed with a ſpecifick propertie, ſhew their efficacie on one humor more then another humor, and that impact more in one part then in another. For thus Agrick chiefly draw's phlegm from the head and joints, Rubarb draw's choller chiefly from the Liver, and hurt's the kidnies. But let us here forbear the conſideration of ſuch things, as not appertaining to Surgerie. But ſom medicines of this kinde are furniſhed with one ſimple facultie, otherſom with more, and thoſe contrarie, whereof you taſte may give you ſufficient notice: for Rubard at the firſt touch of the tongue is found acrid and hot; but when you com to chaw and throughly to taſte it, you ſhall finde it to partake of an earthlie aſtriction. Therefore becauſ taſtes give notice of the faculties of medicines, therefore I have thought good to treat of them briefly.

CHAP.

CHAP. VII.

Of Tastes.

Lib. 1. simpl. TAste, as *Galen* deliver's according to *Aristotle* and *Theophrastus*, is a certain concoction of moisture in drineſs, causſed by means of heat, which wee know or discern by the tongue well tempered, and fittingly furnished with spittle and his nervs. There are nine differences of tastes; for there are three judged hot, to wit, the acrid, bitter, and salt: three cold; the acid, austere, and acerb: three temperate; the sweet, the oilie or fat, and the insipide. Now they are thought so manie, according to the different degrees of concoction; for it appear's greater in hot tastes, and as it were a certain assation, but less in cold, but indifferent, and as it were an elixation in things temperate: therefore Nature observ's this order in the concoctioh of sapid bodies, that at the first the acerb taste should take place, then the austere, and lastly, the acid: from these (as it were) rudiments of concoction, arise's an insipid, then an oilie, then a sweet perfectly concocted and temperate. This concoction exceeding the bounds of mediocritie, there arise's a salt taste, then a bitter, and then an acrid with the higheſt excess of almost a fierie heat. Yet I would bee thus understood, that all things that are by nature sapid, do not alwaies assend to the height of sweetness by the degrees of acerbitie, austeritie, and aciditie, as though it were of absolute necessitie, that all things that are sweet, they should bee acerb, austere, and acid. For there are manie things found, especially in plants and their fruits, which when they shall arrive to their perfection and maturitie, are acid, bitter, or salt, but beeing yet unripe, and not com to full perfection, they have a certain sweetness, which afterwards, by a further digestion, or perfection and concoction, acquire a bitter, austere, or acid taste. For thus bitterness in Wormwood and Aloes, acrimonie in Pepper or Pellitorie, is a perfection of nature, a full ripeness and perfect concoction, and not an excess of heat in that *species*. Also acerbitie and austeritie is a perfection of nature, and not a rudiment in Services and Cornelians; aciditie or tartness is also in verjuice. But in verie manie things it so fall's out, that the sweet or fattie tastes becom so, and acquire their perfection by concoction, as in Grapes, Figs, Pears, Apples, and almost all other such fruits, as wee usually feed upon. Therefore I will now treat of each of them in order, first beginning with cold tastes.

Differences of tastes.

The acerb taste. The acerb taste is cold and terrestrial, and of a substance absolutely gross, beeing less humid then the austere, but much less then the acid. It notablie cool's and drie's, it condensat's, binde's, repel's, especially from the superficies, and it also exasperate's; this taste reside's, and may bee found in Pomegranat pills, Galls, *Sumach*, and Cypress nuts.

The austere. The austere is nigheſt in temper and effects to the acerb, but somwhat moister; for the acerb absolutely consist's in a terrestrial and cold substance. Wherefore this, increased by a degree of concoction, acquire's more store either of heat alone, or elſ of moisture alone, or elſ of both together: moisture, I say, and that is either aierie, or elſ watrie. Therefore if these fruits, which before their maturitie are acerb, have an accession of heat, then do they becom sweet, as you perceiv by Chesnuts; but if there bee an accession of moisture onely, and that more gross, of acerb they becom austere: for both the tastes are in the like degree of cold, but the austere is the moisture. But if to the same frigiditie remaining in fruits, a certain subtle humiditie accrew, then is there causſed an acid taste. But if they have an accession of a watrish moisture and heat, they will acquire a sweet taste, or elſ oilie, if the humiditie accrewing with the heat bee aierie.

I have judged it requisite to admonish you hereof, that you might know by what means sapid bodies mitigated becom sweet of acerb, as it were by these interposed degrees of austeritie, aciditie, and oilinesſ, as they acquire a various accession of heat and moisture separately, or conjunctly.

Now by all that wee have delivered, you may gather, that all acerb and austere things are cold and drie; and as they are cold, they repel and hinder defluxions: as they are drie and terrestrial, they condensate, incrassate, constipate, and straiten the passages; yea, and they also cicatrize: but acerb things perform this far more powerfully, as those which are absolutely terrene, cold, and drie, not partaking of moisture, or water. Now austere things consist (as it were) in a middle matter, that is, in a more dilute terrene bodie, as it is apparent in Services, unripe Grapes, Cornelians, Medlars, Crabs, wilde Pears, and all sort of unripe fruits, whence it is termed a crude taste.

The acid taste. The acid taste is of a cold and watrish nature, but most subtle, by benefit whereof it penetrate's, and divide's almost as powerfully as the acrid. It incide's or divide's, attenuate's, bite's, cleanse's, open's obstructions, repel's and drie's. For by the means of the deep piercing cold, it repel's all defluctions; and by the drying facultie, which is strong even in it's watrie consistence, it staie's and stops all bleedings, the hæmorrhoides and dysenteries. The force thereof is chiefly manifest in Vineger, as also in the juice of Citrons, Sorrel, Cherries, Berberies, and the like. And this is the nature of cold tastes, now it is time wee speak of such as are temperate.

The

The insipid is unproperly termed a taste, as that which is rather a privation of tastes, it is in som sort cold, and of a verie watrish and gross nature, it inspissate's, constipate's, and stupifie's. This kinde of taste is chiefly manifest in Water, and next in Gourds, Citruls, and manie such like things. The insipid.

The oilie taste is hot, humid, and aërie; therefore it humect's, relaxate's, mollifie's, lubricate's. Of this kinde are oil, butter, fat which is not rauced by age, nor acrid by nature, as that of Lions and Foxes. The oilie.

The sweet taste is made by a moderate and well concocting heat, consisting in a matter more tenuious and hot then the insipid, but in somwhat more gross then the oilie, from which in the first qualities it doth not differ; therefore it is of a hot, aërie, and temperate nature. Therefore everie sweet thing detergeth, levigate's, concoct's, ripen's, relaxe's, and asswageth pain. Examples of this taste may bee had in Sugar, Honie, Manna, sweet Almonds, Milk, and other like. Now let us com to hot tastes. The sweet.

The salt taste is hot and astringent, less earthie then the bitter, as that which reside's as it were in a middle matter. For it proceed's from an earthie drines, which is formerly torrified and attenuated by the force of heat in a watrie humiditie. Wherefore that which is salt contract's the pores, cut's, cleanse's, digest's, or rather drie's up the humors by the drines thereof, without anie manifest sens of heat, whence it is, that it vindicate's from putrefaction. Under this kinde are conteined all sorts of salt; as salt-peter, *niter*, *sal Ammoniacum*, *sal gemmæ*, common-salt, sea-water, and such other like. The salt.

The bitter taste is hot, earthie, and drying; for the matter thereof is gross and earthie, which the abounding heat hath torrified and dried up. Wherefore bitter things taken inwardly, purge and carrie away superfluous humors: and outwardly applied, they mundifie and deterge ulcers, they open the mouths and passages of the veins oft-times by their abstergent facultie; whence it is that they moov the courses and hæmorrhoides. The principal things indued with this taste are Aloës, Gall, Wormwood, Gentian, the lesser Centaurie, Coloquintida, Fumitorie, Soot, and such like. The bitter.

The acrid taste is hot, of a subtil and fiërie nature; for it is kindled of a hot, subtle, and drie matter, neither can it consist in anie other. Therefore that which is acrid, heat's, prick's or bite's the mouth by the acrimonie, it heat's, and oft-times burn's, it penearate's, open's the passages, attenuate's, attract's and draw's forth gross humors, evacuate's and send's forth urine, the courses, and sweat: besides it oft-times is septick, blistering, and escharotick; and lastly, burning, and caustick. The septick and putrefactive things are sublimate, *Chamelen*, the juice of *Thapsia*. The vesicatories are Dittander, Cantharides, Crow-foot, Mustard, Pellitorie of Spain, *Euphorbium*. But the caustick and escharotick are Lime, Oke-ashes, and the like. The acrid.

But wee know medicines not onely by the taste, but also by our other senses, as touch, sight, hearing, smell. And as by the taste, so also by these wee judg of and trie the goodnes of medicines, and distinguish the true legitimate from the adulterate. The touch judge's what are hot and cold, moist and drie, rough and gentle, or smooth, hard and soft, brittle or friable, glutinous and viscid, drie or slipperie. Wee approov of the goodnes of medicines by their color, brightnes, or duskines, whereof the eie is judg; for wee commend that Senna which is somwhat greenish, but dislike the whitish: as also wee like well of such Cassia as is black both within and without, shining and full, and not drie and shrunk up. Yet the judgment of the first qualities, by the color is deceitful, or none at all; for such things as are white, or the color of Snow, are not therefore cold: for sundrie of them are hot, as Lime. Neither are red things to bee therefore judged hot; for Roses cool. Also medicines are chosen by the smell; for such as have a good, fresh, and natural smell, are commonly hot, and in their perfect vigor. On the contrarie, things that want smell are for the most part cold and evanid. By hearing wee distinguish things full from such as are emptie: thus wee chuse Cassia, which shaken, make's no noise with the grains or seeds rattling in it. Hitherto wee have explained the first, second, third, and fourth faculties of medicines in general, and have shewed how they may bee found out: now must wee more particularly treat of their second and third faculties, becaus by reason of these they chiefly com into use in Surgerie: Yet let mee first briefly shew by what means and arts they may bee prepared.

CHAP. VIII.

Of the preparation of Medicines.

TO prepare medicines, is nothing els, then by Art to make them more commodious for use and composition, whereby they are either made

More gentle. By *bruising*; as when medicines are broken by striking and rubbing or grindeing in a mortar, and that either of Brass, Iron, Lead, Glass, Wood, Marble, and other like. Considering the thing which is to bee beaten. The strength or force wherewith it must bee performed. The time or space. The situation. The things to bee added. The consistence which the thing beaten must bee of.

More ſtrong

By *ſearſing*; whereby wee ſeparate the pure and finer from the more impure and groſs, which is don by ſivs and ſearſes, made of Wood, Parchment, Horſ-hair, Silk, Lawn. Wherein is to bee noted, that the ſame conſideration is to bee had in ſearſing, as in beating; therefore ſuch things as are to bee finely powdered, muſt bee ſearſed in a finer ſearſ: ſuch as are more groſs, in a courſer.

More pleaſant

By *diſſolving* or *mollifying*; Which is nothing elſ but a diſſolving of a ſimple or a compound medicine, of a thick or hard conſiſtence, either into a mean conſiſtence, or a little more liquid or ſoft, which is performed either by heat onely for by heat gums and horns are mollified: or by liquor, as by vineger, water, wine, juice of Limmons, &c.

More wholeſom

By *deſiccation* or *hardening*; which is nothing elſ, but the conſuming of the ſuperfluous and hurtful moiſture; and this is performed, either by the Sun, or by Fire. By *infuſion*; which is nothing elſ but the tempering or macerating of a medicine a little beaten or cut, in ſom liquor appropriate and fit for our purpoſe; as in Milk, Vineger, Water, oil, and the like, ſo long as the nature of the medicine require's. To Infuſion, Nutrition may bee reduced, which is nothing elſ, but as it were a certain accretion of the medicine, by beeing moiſtened, macerated, rubbed, or groun'd with ſom moiſture, eſpecially with heat. By *burning*; that is, by conſuming the humiditie which is in them. And that, either that they may bee the better powdered, beeing otherwiſe too glutinous, or that they may laie aſide their groſs eſſence, and becom of a ſubtiler temper; or that they may put off, or partly loſe ſom fierie qualitie, as acrimonie, *Gal. lib. 4. cap. 9. ſimplicium.* Or that they may acquire a new color. Now all things are burnt, either alone; as, ſuch things as have a fattie moiſture, as hairs, ſweatie wool, horns: Or elſ with ſom combuſtible matter; as ſulphur, alum, ſalt, barlie, &c.

More fit for mixture

By *boiling* or *elixation*; which is performed by a humid heat; as burning is by a drie, and that either that wee may increaſ the weak faculties of ſuch medicines as are boiled, by boiling them with ſuch as are ſtronger; or elſ to weaken ſuch as are too ſtrong, or elſ wholly to diſſipate ſuch as are contrarie: Or that one facultie may ariſe of ſundrie things of different faculties beeing boiled together, or for the longer keeping them, or bringing them to a certain form or conſiſtence: All which are don, by the Fire, or Sun. By *waſhing* or *cleanſing*; whereby the impuritie of the medicine is waſted away or cleanſed, and ſuch things are either hard: as metals, ſtones, parts of living creatures, condenſed juices, and otherlike: Or ſoft; as Roſins, Gums, Fats, Oils And theſe ought firſt to bee finely beaten, that the water may penetrate in all their ſubſtance. Or to bee diſſolved, and caſt into a veſſel filled with water, and ſo ſtirred, and then ſuffered to ſubſide, ſo that the fat mayſwim aloft: And this muſt bee don ſo long that the water retain nothing thereof in color, ſmell, or taſte.

CHAP. IX.

Of repelling, or repercuſſive Medicines.

Aſtringents are underſtood by the name of repellers.

The differences of repercuſſives.

REpelling or repercuſſive medicines are cold, and of groſs and earthie parts; by which name alſo aſtringent medicines are underſtood, becauſ they hinder the falling down of the humors upon the part. Repercuſſives are ſuch, either of their nature, and of themſelvs, or elſ by accident, beeing not ſuch of their own nature. Theſe which of themſelvs are ſuch, are of two kindes; for ſom are watriſh and moiſt, without anie aſtrictive facultie, which almoſt wholly proceed's from an earthie eſſence; wherefore that facultie of repelling which they poſſeſs, they have it wholly from coldneſs. Of this kinde are lettuce, purſlain, ſow-thiſtle, duck's-meat, kidnie-wurt, cucumbers, melons, gourds, houſ-leek, mandrag-apples, night-ſhade, henbane, and the like, which cool powerfully, and unleſs they bee taken away before the part wax blackiſh, they extinguiſh the natural heat. Other ſom are of an earthie eſſence, and therefore aſtrictive; but yet ſom of theſe are hot, other ſom cold. Such things as are cold of temper, and of an earthie conſiſtence, are properly and truly termed repellers. Of theſe, ſom are ſimple, other ſom compound: the ſimples are plaintain, vine-leavs, leavs of roſes, okes, brambles, cypreſs, berberies, *ſumach*, all unripe fruits, verjuice, vineger, red wine, the juice of ſower pomegranats, *acacia*, the juice of barberries, and quinces, *hypociſtis*, pomegranate-pills, oke-bark, the flowers of wilde pomegranats, the meal of barlie, beans, panick, oats, millet, *orobus* mixed with juices in form of a pultis, bole-armenick, *ſanguis draconis*, ceruſs, litharge, *terra ſigillata*, fuller's-earth, chalk, marl, the load-ſtone, lead, corals, all marchiſites, antimonie, *ſpodium*, true *pomphylix*, all ſorts of earth, and other things of the like nature.

Now compound things are *Oleum roſaceum, omphacinum, mirtillorum, papaveris, cidoniorum, nenupharis, unguentum roſatum, album rhaſis, camphoratum, emplaſtrum diacalcitheos*, diſſolved in vineger and oil of roſes, *deſiccativum rubrum, populeon, emplaſtrum nigrum ſeu tetrapharmacum* of *Galen's* deſciption, *empl. contra ruptur am, de ceruſa, pro matrice.* All ſuch cold repercuſſives

repercussives are more effectual if they bee associated with tenuitie of substance, either of themselvs, or by mixture with som other things: for to this purpose wee often mix vinegar, camphire, and the like things of subtil parts, with repercussives of gross parts, that they may serv as *vehicles* to carrie in the repercussive's facultie. Repercussives of gross parts and hot, are wormwood, centorie, gentian, agrimonie, savin, coriander, mint, baie-leavs, cardamomes, *calamus, aromaticus*, aloes, spiknard, saffron, nutmeg, cinnamom, amber, salt, alum, coporas, *sulphur, oleum absinthinum, mastichinum, nardinum, costinum, ceratum, Gal. stomachicum, santalinum, emplastrum diacalcitheos.* But such things as repel by accidenc, are bandages, compresses, linnen-cloths, and rowlers of all sorts, cases, cauteries, blood-letting, cupping, painful frictions in the opposite parts, and other such like things as are properly said to make revulsion. The use of repercussives is to force back the humor which flow's from anie other place into the part, and thus they mitigate the heat of such inflammation as that defluxion of humors hath caussed, yea, oft-times to asswage and help pain, the fever, absceses, malign ulcers, and mortification. Such repercussives must alwaies bee so opposed to the diseas, that respect may bee had to the temper, complexion, and particular nature of the part whereto they are applied; for all parts cannot equally bear the like force of repercussives, as nervous and other spermatick and cold parts. Furthermore, there are som parts whereto wee may by no means applie repercussives; as the groins, arm-pits, and those glandules or kernels which are behinde the ears and brain, lest the humor should retire back into som of the Principal parts: the like reason is also of bodies; for the bodies of women, children, eunuchs, cannot endure so strong repercussives and the like excess of cold as the manlie and vigorous bodies may. Besides, everie diseas require's not repercussives, for if the bodie bee repleat with ill humors; if it bee plethorick; the use of repercussives, unless after general purgation, cannot bee safe; as neither if the humor, which is in motion, shall bee venenate, gross, acrid, critical, or shall caus great pain in the part, for then on the contrarie wee must rather make use of attractives. But now if the diseas bee great, weak repercussives will avail nothing against it, as lettuce against a great inflammation; and thou shalt do ill if thou set upon a small defluxion with powerful repellers; for by that means the skin is straitned, and the passages thereof stop't, whereby the inflammation is increased, or elss brought to a *scirrus*. Wherefore let the Surgeon have a care that hee temper the force of his Repercussives according to the magnitude of the diseas.

Why things of subtil parts are oft-times mixed with repercussives.

Repellers by accident.

When, and to what parts repercussives must bee applied.

CHAP. X.

Of attractive medicines.

What an attractive medicine is.

AN attractive medicine is contrarie to the repeller; the Greeks call it *Helkticon*, it is of a hot and thin substance, whereby it draweth forth into the superficies of the bodie that which lieth hid in the center, although somtimes it doth it by an occult qualitie; other-whiles also by accident, as by the acrimonie. Those things which by a manifest qualitie do attract, are either simple or compound.

Attractives by a manifest qualitie.

The simple are *Bryonia, allium, cæpa, porrum, aristolochia, hermodactyli, ciclamen, lilium, sigillum beatæ Mariæ, arum, asarum, asphodelus, gentiana, pyrethrum, ruta, sabina, calamentum, omnes tithymalorum species, viscum, abrotanum, anagallis, urtica, ranunculus, struthium*, and such like: *Ammoniacum, bdelium, gabbanum, sagapenum, euphorbium, asphaltum, cinis è fæce vini vel aceti, calx viva, sulphur, sal ammoniacus, omnis salis species, auripigmentum, oleum vetus, adeps leonis, ursi, canis, anseris, viperæ, ranarum, axungia porci vetustate acris, aut attritu rotarum. Composita verò, ut oleum de spica, philosophorum, de terebinthina, de croco, de scorpionibus, rutaceum, vulpinum, laurinum, anethinum, de vitriolo, unguentum Agrippæ, aragon, seu auxiliare, martiatum, enulatum, theriaca, mithridatium, empl. de meliloto, diachylon magnum & parvum, oxycroceum, divinum.*

By an occult.

Those things which draw by a secret propertie in nature, as are the load-stone, quick-silver, pyonie, amber, all antidotes and triacles that are remedies against the biteings of venemous beasts, and all purging medicines.

By accident.

These which draw by accident, perform it otherwise then of their own nature, they have that qualitie out of putrefaction and corruption, as dove's dung, goat's dung, cow-dung, man's dung, and all kinde of dungs: also leven, old cheese, and such like.

Cupping glasses, leeches, syringes, rougher and harder frictions, sucking, pain, straight ligations, cauteries do also draw, but after a different manner from them spoken of before.

Their use.

Attractive medicaments must neither burn nor discuss, and beeing verie strong and sharp, they should bee tempered and mixed with oil of roses, and other lenitives: but to weak ones should bee added oil of baies, *calx viva*, and such like to strengthen them. The use of attractives is to draw poison toward the skin, and to hasten forward critical absceses;

and they make thoſe parts which are benummed and conſumed, to have life, they reſtore the refrigerated parts by drawing thither the ſpirits; they draw forth the viſcous filth of malign ulcers that lie's hid in the nervs, and hollow paſſages of them; they alſo draw out ſcales of bones, ſplinters of wood, nails, thorns, arrows, and that matter which is impact in hardned inflammations.

CHAP. XI.

Of reſolving Medicines.

What a reſolving medicine is. The differences thereof.

THat is called a reſolving medicine, which by heat, and the tenuitie of his ſubſtance openeth the pores, attenuate's the humors, diſſipate's and diſcuſſeth by evaporating the unprofitable matter. There are two ſorts of theſe kindes of medicines; the one is called *Arœoticum* or rarifying; the other is termed *Diaphoreticum*, or digeſting.

The *Arœoticum* by a mean heat, and not drie, and indued with a tenuitie of ſubſtance, openeth and relaxeth the skin, and draweth forth the matter ſhut up under it, whereby it may eaſ pain, like as Anodynes, becauſ it doth not much depart from a temperate heat.

But the *Diaphoreticum* beeing much hotter, whatſoever ſticketh in the part beeing there impact, it doth by thin vapor inſenſibly diſſipate: therefore the acrid and hot things are in this caſe to bee made uſe of rather then then attractives, becauſ that cold and groſsneſs is more difficulty to bee digeſted, and the length and involution of the waies beeing to bee conſidered. The Arœotick, which wee may call weak reſolvers, are either ſimple or compound.

The ſimples are theſe, *Biſmalva tota, parietaria, adiantum, mercurialis, ebulus, valeriana, roſmarinus, ſalvia, thymus. chamæmelum, melilotum, anetum, farina hordei, tritici, ſeminis lini, fœnugræci, nigella, furfur, adeps gallinæ, anſeris, anatis, cuniculi, vituli*; almoſt all metals unleſs ſuch as are acrid. The compounds are *Oleum chamæmolinum, anethinum, liliaceum, catellorum, lumbricorum, Keirinum, de vitellis ovorum, de tritico, amygdalarum dulcium, Unguentum de althæa, empl. diachylum, ireatum.* Diaphoreticks or digeſtives, are alſo both ſimple and compound: The ſimple are *Ariſtolochia, enula campana, iris, cæpa, ſcylla, ſigillum Salomonis, ſigillum beatæ Mariæ, bryonia, panis porcinus, draconculus, aſphodelus, origanum, mentha, pulegium, ſabina, ſerpillum, calamentha, hyſſopus, urtica, artheniſia, lavendula, chamæpytis, aniſum, faniculum, cuminum, piper, nux moſchata, coriandrum, baccæ lauri & juniperi, farina, fabarum, lupinorum, orobi, milii, frumenti, furfur, mica panis, acetum tepidum, oxycratum, vinum vetus aut aromaticum, mel, aqua vitæ, muria, adeps tauri, equi, leonis, canis, hirci, medulla cervi, cruris bovis & arietis, ammoniacum, galbanum, opopanax, ſagapenum, myrrha, bdelium, thus, terebinthina, pix nigra, ladanum, ſtirax, calamita, benioinum, ſtercus caprinum, columbinum, caninum, bubulum, & aliæ ſtercorum ſpecies.*

Compound diaphoreticks are *Oleum amygdalarum amararum, Juniperinum, laurinum, de ſcorpionibus, irinum, coſtinum, nardinum, de terebinthina, de croco, canabinum, raphaninum, è cucumere agreſti, vulpinum, rutaceum, philoſophorum de lateribus, de euphorbio, de tartaro, de petroleo, de kerva, ſive ricininum, unguent. Agrippæ, aragon, martiatum, enulatum, empl. de Vigo,* without addition, and with addition, *oxycroceum, diacalcitheos,* diſſolved in a digeſting oil to the form of a cerat.

Arœoticks are profitably uſed in the increaſ and ſtate of ſuperficial tumors.

The uſe of diaphoreticks.

But Diaphoreticks are not to bee uſed in the increaſ of tumors, unleſs ſom aſtringent bee added, leſt by their more ſtrong digeſtion, they ſhould draw and increaſ the defluxion: but when the tumors decline, they are then onely to bee uſed in the parts chiefly where the skin is denſ and hard, and when the humor is cold and groſs, and lying hid deep in the bodie, ſo that the virtue of medicaments can hardly com thereto: but conſideration is to bee had of the parts to which reſolutives are to bee applied; for you may not applie relaxers or diaphoreticks to the liver, ſpleen, ſtomach, or bowels, unleſs you add ſom aſtringents, of which a great part muſt bee aromaticks.

To the parts, where ſenſ is more dull, may bee applied the ſtronger diaphoreticks, but thoſe parts which are indued with a more exquiſite ſenſ, as the eie and the nervs, to them wee muſt applie weaker. When the matter is groſs and cold, things cutting and attenuating, and then emollient are to bee uſed, and ſo by degrees com to diaphoreticks; otherwiſe that onely is reſolved which is the moſt ſubtil of unprofitable matter, the groſſer becomming concrete and hardned. But if the part bee afflicted with a continual defluxion, ſo that there may bee danger of a gangrene or ſphacel, it is not lawful then to make uſe of reſolvers, but you muſt in the place where the humor flow's, divide the skin by ſcarification, as it is moſt learnedly noted by *Hollerius* in that profitable book of his left to poſteritie, whoſe title is, *De materia Chirurgica.*

CHAP.

CHAP. XII.

Of Suppuratives.

A Supparative medicine is said to bee that, which shutting the pores, and preventing transpiration by his emplastick consistence, increaseth the matter of native heat, and therefore turneth the matter cast out of the vessels into *pus* and *sanies*. It is of nature hot and moist, and proportionable to the native heat of the part to which it is applied, and of an emplastick consistence, that so it may hinder the native heat from beeing exhaled; in which respect it differeth from emollients and malacticks, of which wee shall speak hereafter. There bee two kindes of suppuratives, for som do it of themselvs, and by their proper qualitie; others by accident. Those things which by their own strength do bring to suppuration, are either simples or compounds.

What a suppurative medicine is.

Differences of suppuratives.

Simples are *radix liliorum, cæpa, allium, malvarum omnium folia & semina, buglossum, acanthus, senecio, violæ, parietaria, crocus, caules, ficus, passulæ mundatæ*, with a decoction of these things, *farina tritici, farina volatilis, farina hordei excortitati, lolii, seminis lini & fænugræci, galbanum, ammoniacum, styrax pinguis, ladanum, viscum aucupatorum, thus, pix, cera, resina, colla, adeps, suillus, vitulinus, vaccinus, caprinus, butyrum, vitellus ovi, æsipus humida, stercus suillum, columbinum, caprinum, pueri.*

Compounds are *oleum liliorum, lumbricorum, de croco, unguent. basilicum, emplast. diachilon commune, magnum, de mucilaginibus.*

Those things do suppurate by accident which work it onely by the means of an emplastick consistence: for so often-times astringents, becaus they are of earthie and thick parts, are found to suppurate; such are *unguentum de bolo nutritum*, and such like. Such also are those which by their coldnes keep the heat in, and shut the pores. Hence it is that the qualities of sorrel are commended to generate *pus*: for whil'st it keepeth the heat within, it increaseth his effects, to the thickning of the suppurable matter, and the overcomming other rebellious qualities. Wee use things ripening in great inflammations, whose growth wee cannot hinder with repellers, or increas with resolvers or discussers.

Suppuratives by accident.

CHAP. XIII.

Of Mollifying things.

That is defined to bee a mollifying medicine, which by a stronger heat then that which is proper to suppuratives, without anie manifest qualitie of drying or moistning, again malaxeth or softeneth hardned bodies: wherefore this differ's from that which suppurate's, becaus that they bee hot in the first or second degree, according to the several temper of the bodie, or part to which it is applied, working rather by the quantitie of heat, then the qualitie: contrariwise, that which mollifieth beeing indued with a greater heat, rather worketh by the qualitie of the heat, beeing otherwise in drines and moisture temperate.

Gal. cap. 7. lib. 5. simp.

How suppuratives & emollients differ.

Although as manie things agree together in som respects, though of a diverse nature; so manie emollients are such as are hot in the first degree, and drie in the second and third, that so they may the better disperse and diffuse that which is congealed, by taking away a little of the humiditie, which is contained within the part affected: but not by exhausting it wholly by the violence of heat or drines: for hereon would follow a greater hardnes.

Things mollifying, are either simple or compound; and these again strong or weak. The weak are, *Radix liliorum alborum, cucumeris agrestis, althæa, folia malvæ, bismalvæ, liliorum, anethi summitates, viola, branca ursina, semen malvæ, bismalvæ, lini, fænugræci, carici pingues, passulæ mundatæ, pedum, capitum, intestinorum vervecinorum decoctum, adeps ex juvenculis & castratis, domesticis, fœminis animalibus, adeps suillus, vitulinus, hædinus, caprinus, bubulus, vulpinus, gallinaceus, anserinus, anatinus, olorinus, efficaces.* The weaker are things more gentle; as, *Butyrum, lana succida, cera pinguis, vitellus ovi, medulla ex ossibus, cervina, ovilla, caprina.* The compound are oil, wherein are boiled mollifying herbs; as, *Oleum liliorum, chamæmelinum, amygdalarum dulcium.* Stronger emolliments are, *Acetum, adeps taurinus, ursinus, cervinus, leoninus, pardalinus, apri, equi sevum, pinea, picea, abietina, terebenthina, ammoniacum, bdelium, styrax, galbanum, ladanum, propolis, opopanax, ung. de althæa, emp. diachylon commune & magnum, de mucilaginibus, veronicum, oxycroceum, Joannis de vigo.*

The differences of emollients.

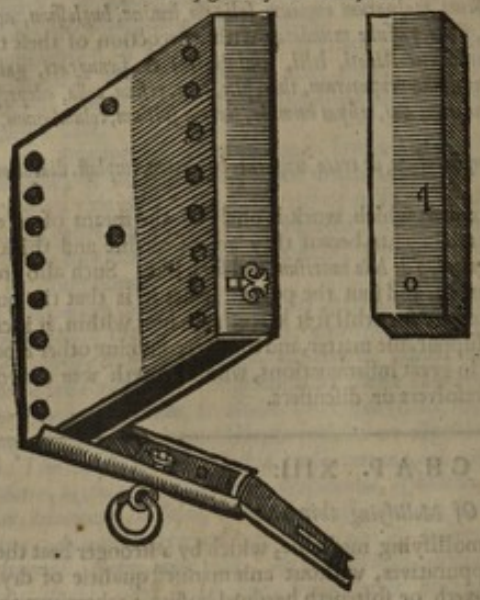
Wee use emollients in scirrous tumors of the muscles, or in the lips of ulcers, in anie of the limbs, bellie, glandules, bowels, by reason of a gros, cold, and viscous matter, either phlegmatick, or melancholick. Yet those tumors which com of melancholie, commonly turn to cancers, which are exasperated by mollifying things. On the contrarie, such as proceed from a phlegmatick matter, are brought to an equalitie of consistence, by the use of emollients. Furthermore, there are three things observable in the use of emollients: the first is,

Their use.

Things obſervable in the uſe of emollients.

duly to conſider how much the affected parts differ's from his proper and naturall temper and proportion, that ſo wee may applie an equivalent remedie. The ſecond is, that wee diſtinguiſh the natures of the parts. The third is, that wee artificially gather after what manner this mollifying muſt bee performed; that is, whether wee ſhould mingle with the emolliments, deterſive or diſcuſſing medicines. For there are manie deſperate ſcirrous tumors, that is, ſuch as cannot bee overcom by anie emollient medicine, as thoſe which are grown ſo hard, that they have loſt their ſenſ; and thereupon are becom ſmooth and without hairs. Here you muſt obſerv, that the part ſomtimes becom's cold in ſo great an exceſs, that the native heat plainly appear's to languiſh, ſo that it cannot actuate anie medicine. That this languiſhing heat may bee reſuſcitated, an iron-ſtove ſhall bee ſet neer to the part, wherein a good thick piece of iron heated red hot ſhall bee encloſed, for ſo the ſtove will keep hot a long time.

The figure of an iron ſtove.



A. *The caſe of the ſtove.*
B. *The iron-Bat to bee heated.*
C. *The lid to ſhut the ſtove.*

CHAP. XIV.

Of Deterſives, or Mundificatives.

A Deterſive is defined to be that which doth deterge or cleanſ an ulcer, and purge forth a double kinde of excrement; of the which one is thicker, which is commonly called *ſordes*, which is drawn forth from the bottom of the ulcer, by the edificatious qualitie of the medicine, the other is more thin and waterie, which the Greeks call *Ichor*, the Latins *Sanies*, which is taken away by the drineſs of the medicine; and therefore *Hippocrates* hath well adviſed, that everie ulcer muſt bee cleanſed and dried.

Deterſives.

Of Deterſives, ſom are ſimple, ſom compound, ſom ſtronger, ſom weaker. The ſimple are either bitter, ſweet, or ſowr: the bitter are *Gentiana, Ariſtolochia, iris, enula, ſcilla, ſerpentaria, centaurinum minus, abſinthium, marrubium, perforata, abrotonum, apium, chelidonium, ruta, byſſopus, ſcabioſa, artbemiſia, eupatorium, aloë, fumus terræ, hædera terreſtris*, a *lixivium* made with the aſhes of theſe things, *lupini, orobus, amygdala amara, faba, terebinthina, myrrha, maſtiche, ſagapenum, galbanum, ammoniacum*, the gals of beaſts, *ſtercus caprinum, urina bene cocta, ſquamma æris, æs uſtum, ærugo, ſcorta æris, antimonium, calx, chalcitis, miſy, ſory, alumen*. The ſweet are *Viola, roſa, mellilotum, ficus pingues, dactyli, uvæ paſſæ, glycyrrhiza, aqua hordei, aqua mulſa, vinum dulce, mel ſaccharum, ſerum, lactis, manna, thus*. The ſharp are all kinde of ſowr things, *Capreoli vitium, acetum*, and other acid things. The compound are *Syrupus de abſinthio, de fumaria, de marrubio, de eupatorio, de artbemiſia, aceroſus, lixivium, oleum de vitellis ovorum, de terebinthina, de tartaro, unguentum mundificativum de apio, apoſtolorum, pulvis mercurialis*. Wee uſe ſuch things as deterge, that the ſuperfluous matter beeing taken away, nature may the more conveniently regenerate fleſh to fill up the cavitie: But in the uſe of them, conſideration is firſt to bee had of the whole bodie, whether it bee healthie, plethorick, or ill diſpoſed, there is conſideration to bee had of the part, which is moiſter and drier, indued with a more exquiſite or duller ſenſ. But oftentimes accidents befal ulcers beſides nature, as a *callus*, a defluxion of a hot or otherwiſe malign humor, and the like ſymptoms. Laſtly, conſideration is to bee had, whether it bee a

Their uſe.

new

new or inveterate ulcer; for from hence, according to the indication, remedies are appointed different in quantitie and qualitie: ſo that oftentimes wee are conſtrained to appoint the bitter remedie in ſtead of the ſweet. Neither truly with a painful and drie ulcer doth anie other then a liquid deterſive agree: neither to the moiſt anie other then that of a drie conſiſtence, as Powders.

CHAP. XV.

Of Sarcoticks.

THat medicine is ſaid to bee ſarcotick, which by its drineſs help's nature to regenerate fleſh in an ulcer hollow, and diligently cleanſed from all excrements. But this is properly don by blood indifferent in qualitie and quantitie. Wherefore, if wee muſt ſpeak according to the truth of the thing, there is no medicine which can properly and truly be called ſarcotick: For thoſe which vulgarly go under that name, are onely accidentally ſuch; as thoſe which without biting and eroſion do drie up and deterge the excrements of an ulcer, which hinder the endevour of nature in generating of fleſh. For as by the law of nature, from that nouriſhment which flow's to the nouriſhing of the part, there is a remain, or a certain thin excrement, flowing from ſom other place, called by the Greeks *Ichor*, and by the Latines *Sanies*: Thus by the corruption of the part there concreet's another groſſer excrement, termed *Rypos* by the Greeks, and *Sordes* by the Latines. That make's the ulcer more moiſt, this more filthie. Hence it is, that everie wound which require's reſtitution of the loſt ſubſtance, muſt bee cured with two ſorts of medicines, the one to drie up and waſte the ſuperfluous humiditie thereof, the other to fetch off the filth: and by how much the wound is the deeper, by ſo much it require's more liquid medicines, that ſo they may the more eaſily enter into everie part thereof. No medicine truly ſarcotick

But diverſitie of things ſhall bee appointed according to the various temper of the part. For if the affected part ſhall bee moiſt by nature, ſuch things ſhall bee choſen as ſhall bee leſs drie: if on the contrarie the part bee drie, then ſuch things ſhall bee uſed as bee more drie; but manie ſorts of medicines ſhall bee aſſociated with the ſarcoticks, according to the manifold complication of the effects poſſeſſing the ulcer. Therefore nature onely is to bee accounted the workmaſter, and the efficient cauſ in the regenerating of fleſh, and laudable blood the material cauſ, and the medicine the helping or aſſiſting cauſ, or rather the cauſ without which it cannot bee: as, that by cleanſing and moderately drying without anie vehement heat, tak'es away all hinderances of incarnation and orders, and fit's the blood to receiv the form of fleſh. This kinde of medicine according to *Galen*, ought to be drie onely in the firſt degree, leſt, by too much drineſs, it might drink up the blood and matter of the future fleſh, which notwithſtanding is to bee underſtood of ſarcoticks, which are to bee applied to a delicate and temperate bodie. For if the ulcer bee more moiſt, or the bodie more hard then is fit, wee may aſſcend to ſuch things as are drie, even in the third degree. And hence it is that ſuch drie medicines may firſt bee called deterſives, and then preſently ſarcoticks. A ſarcotick medicine is either ſimple or compound, ſtronger or weaker. Simple ſarcotick medicines are, *Ariſtolochia utraque, iris, acorus, dracunculus, aſarum, ſymphyti omnia genera, betonica, ſanicula, milleſolium, lingua canis, verbena, ſcabioſa, pinpinella, hypericon, ſcordium, plantago, rubia major, et minor eorumque ſucci. Terebinthina lota & non lota, reſina pini, gummi arabicum, ſarcocolla, maſtiche, colophonia, manna thuris, cortex ejuſdem, aloë, olibanum, myrrha, mel, vinum, ſanguis draconis, lythargyros auri, ſpodium, pompholix, tutia, plumbum uſtum lotum, ſcoria ferri.* The compound ſarcoticks are, *Oleum hyperici-nis, el. ovorum, maſtichinum, & cætera olea, quæ balſami nomine appellantur, unguentum aureum, emp. de betonica, vigonis, de janua, Emp. gratia Dei, Emp. nigrum.* Wee uſe not ſarcoticks before that the ulcer bee cleanſed and free'd from pain, defluction, inflammation, hardneſs, and diſtemper. In uſing theſe things wee conſider the temper of the bodie, and the affected part: For oft-times a part otherwiſe leſs drie by nature, require's a more powerful drying medicine, and ſtronger ſarcotick, then another part which is more drie, and this for ſom other reaſon, which ought to com into our conſideration: For example, the *glans* would bee more dried then the produce, although it bee of a temper leſs drie, becauſ it is a paſſage of the urine. Wherefore wee muſt diligently obſerv the condition of the affected parts, and thence taking indication, make choice of more ſtrong ſarcoticks. For both that which is too little, and that which is too much ſarcotick, make's a ſordid ulcer: the firſt, becauſ it drie's not ſufficiently; the later, for that by its acrimonie it cauſſeth defluxion. Therefore diligent care muſt bee uſed in the examination hereof. Simple ſarcoticks. Compound Sarcoticks.

CHAP. XVI.

Of Epuloticks, or skinning medicines.

AN Epulotick medicine is that which covereth the part with skin: it is ſaid to bee ſuch as by drineſs and aſtriction without biting deſiccate's, binde's and condenſate's the fleſh into a certain callous ſubſtance, like to the skin, which wee commonly call a cicatrize or ſcar:

ſcar: yet this, as the generating of fleſh, is the work of nature. A medicine therefore is ſaid to bee Epulotick, for that it aſſiſt's nature in ſubſtituting and generating a ſcar, in ſtead of the true skin, whileſt it conſume's the ſuperfluous humidities, condenſate's, increaſſate's, and binde's the next adjacent fleſh; therefore it ought to drie more powerfully then a ſarcotick. Epulotick medicines are of three kinds: the firſt is the true epulotick: which onely drie's and bind's. The ſecond is an acrid and biting epulotick, which, for that it waſte's the proud fleſh, is called ſo; and this muſt bee ſparingly uſed, and that onely to hard and ruſtick bodies. The third is that which onely drie's without aſtriction. The things whereof they conſiſt are theſe: *Ariſtolochia utraque, gentiana, iris, centaurium majus, pentaphyllon, ſymphytum majus, chamædrys, betonica, cauda equina, eupatorium, verbenaca, plantaginis & ſymphiti folia, gallæ, baccæ myrti, glandes & earum calices, balauſtia, cupreſſi nuces, malicorium, cortex quercûs, cortex tamaricis, cortex ligni aloës, acacia, colophonia, ſarcocolla, ſanguis draconis, ladanum, lithargyros, auri, argenti, ceruſa, plumbum uſtum, alumen uſtum, rutbia, ſquamma æris & ferri, & eorum ſcoria, æruge, flos æris, æs uſtum et lotum, ſulphur vivum, chryſocolla, corali, bolus armenus, terra ſigillata, cineres buccenarum, offeorum, ſilicis, oſſa uſta et ſiccata, caries lignorum, ung. diapompholygos, ung. alb. rhaſis, de ſiccativum rubrum, emp. de ceruſa, de betonica, diacalcitheos, emp. nigrum.*

Three ſorts of Epulotick's.

Their uſe. Wee uſe Epuloticks when as the ulcer is almoſt filled up, and equal to the adjacent skin. In the uſe of theſe wee muſt alwaies have reſpect to the tenderneſs and hardneſs of the bodie; for ſuch things as are corroſives to tender and delicate bodies, are epulotick to hard and ruſtick bodies. Alſo wee have much regard, whether the bodie bee plethorick or replete with ill humors, for ſuch do not eaſily admit cicatrization. Alſo it is moſt worthie of your obſervation, to mark whether the ulcer that is to bee cicatrized, bee fed or nouriſhed by the preſent defect of anie part, as the liver, ſpleen, lungs, or a *varix* lying about it. For it cannot bee cicatrized before theſe impediments (if anie ſuch bee) bee taken away. Laſtly, the callous lips of an ulcer, unleſs they bee ſcarified or ſoftened, hinder cicatrization. Therefore all ſuch defaults muſt bee taken away, and then ſuch an Epulotick applied, as may not by the too much drieneſs leav the ſcar too hollow, or the too little, leav it too high.

CHAP. XVII.

Of Agglutinatives.

AGlutinating, or agglutinative medicine is of a middle nature, between the Sarcotick and Epulotick, more ſtrong then the former, and weaker then the later, for it is drie to the ſecond degree. It by the drying and aſtrictive facultie, void of all deterſion, conjoin's parts that are diſtant, or rather lend's helping hands to nature the principal agent in this work. Glutinatives, whether they bee ſtrongly or weakly ſuch, do agglutinate either by their proper or accidental nature: Of this ſort are *Plantaginis omnes ſpecies, conſolida utraque, bugloſſa, millefolium, verbena, pimpinella, piloſella, cauda equina, ſempervivum, telephium, ſanicula, atractilis, folia querc⁹ et dracunculi, ſalix, ebulus, ſambucus, pentaphyllon, veronica, cortex pini, ulmi, palmæ querc⁹, Aqua vitis, aq. è folliculis ulmi, ſuccus calamintbæ, vinum auſterum, terebinthina, myrrha, ſanguis draconis, bolus armenus, terra ſigillata, omnia denique acerba.*

Agglutinative medicines.

Glutinatives by accident. Glutinatives by accident are thoſe that hinder defluction, and binde the part, as Sutures, Bandages, Reſt, rowlers, and the like. Wee uſe glutinatives in green, and as yet bloodie wounds, whence the Greeks call a glutinative medicine *Enæma*, although ſomtimes they are uſed to inveterate, malign, fiſtulous and ſinuous ulcers; for they hinder the defluction from comming to the lips of ulcers. You muſt conſider, when as you intend to applie them, whether the skin bee whole or no: For ulcers knit together, or heal more difficultly, if the skin bee rubbed off, or cut, or otherwiſe loſt. Neither ought you to bee unmindful of the forementioned cautions and indications drawn from the ſex, the tenderneſs or hardneſs of the affected bodie, the continuance and magnitude of the ulcer: for hence indication muſt bee taken, what the quantitie and qualitie of the medicine ought to bee.

CHAP. XVIII.

Of Pyroticks, or cauſtick Medicines.

THat medicine is ſaid to bee Pyrotick or Cauſtick, which by its acrimonie and biting, commonly conſiſting in an earthie conſiſtence, either ſuperficially corrode's, or more deeply eat's and putrifie's, or laſtly, burn's and conſume's the skin and fleſh, ſo that it even pierce's into callous and hard bodies. Therefore there are three degrees of Pyroticks; for ſom are termed cathæretick or corroding, for that they waſte the proud fleſh of an ulcerated or anie other part, and theſe are judged the weaker ſort of Pyroticks. Otherſom are termed Septick or putrefying, as thoſe which deſtroie and diſſolv the tender and new-ſprung-up fleſh, and raiſ bliſters in the skin, and theſe are more powerful then the chathæreticks. Laſtly, there are otherſom termed moſt powerful Eſcharoticks, which by their fierie and ter-

Three degrees of Cauſticks.

reſtrial

reſtrial qualitie cauſ eſchars or cruſts; whereupon they are alſo termed *Ruptoria*, and potential Cauteries: Now all theſe differences are taken from that they are more or leſs powerful. For it oft-times happen's, that according to the different temper and conſiſtence of the parts, according to the longer or ſhorter ſtaie, a Cathæretick may penetrate as far as a Septick, and on the contrarie, an Eſcharotick may enter no farther then a Septick.

Cathæticks. Theſe are judged Cathæreticks, *Spongia uſta, alumen uſtum & non uſtum, vitriolum uſtum, calx mediocriter lota, ærugo, chalchanthum, ſquamma æris, oleum de vitriolo, trochiſci andronis, phæſionis, aſphodelorum, ung. Ægipticum, apoſtolorum, pulvis mercurii, arſenicum ſublimatum.*

Septicks and Veſicatories. Septicks and Veſicatories are, *Radix ſcillæ, bryoniæ, ſigill. beatæ Mariæ, bugloſſa, radix ranunculi, panis porcini, apium, riſus, lac tithymallorum, lac fici, euphorbium, anacardus, ſinapi, cantharides, arſenicum ſublimatum:* For all theſe weaken the native temper and conſiſtence of the part, and draw thereunto humors plainly contrarie to nature.

Eſcharoticks. Eſcharoticks or Cauſticks are *Calx viva, fex vini cremata, & præcipuè aceti, ignis*, whereto are referred all Cauteries, as well actual as potential, whereof wee ſhall treat hereafter.

Their uſe. Wee uſe Cathæreticks in tender bodies and diſeaſes not verie contumacious; therefore by how much they are leſs acrid and painful, by ſo much oft-times they penetrate the deeper, for that they are leſs troubleſom by delaie; but wee uſe Septicks, and ſomtimes Eſcharoticks in ulcers that are callous, putrid, and of unexhauſted humiditie, but principally in cancers, carbuncles, and exceſſive hæmorrhagies. When as wee make uſe of theſe, the patient muſt have a convenient diet appointed, muſt abſtain from wine: laſtly, they muſt not bee uſed but with great diſcretion; for otherwiſe they may cauſ fevers, great inflammations, intolerable pains, ſwounings, gangreens, and ſphacels. Cauteries heedfully uſed, ſtrengthen and drie the part, amend an untameable diſtemper, dull the force of poiſon, bridle putrefaction and mortification, and bring ſundrie other benefits.

CHAP. XIX.

Of Anodynes, or ſuch as mittigate or aſſwage pain.

What pain is. BEfore wee treat of Anodyne medicines, wee think it fit to ſpeak of the nature of pain. Now pain is a ſorrowful and troubleſom ſenſ, cauſſed by ſom ſudden diſtemper, or ſolution of continuitie. There are three things neceſſarie to cauſ pain; The efficient cauſ, that is, a ſodain departure from a natural temper or union: the ſenſibleneſs of the bodie receiving the dolorifick cauſ: laſtly, the apprehenſion of this induced change, cauſſed either by diſtemper or union; for otherwiſe with how exquiſite ſoever ſenſ the bodie receiving the cauſ is indued with, unleſs it apprehend and mark it, there is no pain preſent. Hence is that Aphoriſm of *Hyppocrates, Quicunq; parte aliquâ corporis dolentes dolorem omninò non ſentiunt, his mens ægrotat*, that is, Whoſoever pained in anie part of their bodies do wholly feel no pain, their underſtanding is ill affected and depraved. Heat, cold, moiſture and drineſs, induce a ſodain change of temper; and heat and cold cauſ ſharp pain, drineſs moderate, but moiſture ſcarce anie at all: for moiſture cauſeth not pain ſo much by its qualitie, as it doth by the quantitie. Both the fore-mentioned qualities, eſpecially aſſociated with matter, as alſo certain external cauſſes too violently aſſailing ſuch as theſe that may cauſ contuſion, cut, prick, or too much extend. Wherefore pain is a ſymptom of the touch, accompanying almoſt all diſeaſes; therefore oft-times leaving theſe, they turn the counſel of the Phyſician to mitigate them, which is performed either by mitigating the efficient cauſſes of pain, or dulling the ſenſ of the part. Hereupon they make three differences of Anodynes: For ſom ſerv to cure the diſeaſ, otherſom to mitigate it, otherſom ſtupifie, and are narcotick. We term ſuch curative of the diſeaſes, which reſiſt, and are contrarie to the cauſſes of diſeaſes. Thus pain, cauſſed by a hot diſtemper, is taken away by oil of Roſes, Oxycrate, and other ſuch like things, which amend and take away the cauſ of pain, to wit the exceſs of heat. Pain cauſſed by a cold diſtemper, is amended by *Oleum Laurinum, Nardinum, de Caſtoreo.* Pain occaſioned by too much drineſs, is helped by *Hydrælium*, a bath of freſh and warm water. Laſtly, by this word Anodyne, taken in the largeſt ſenſ, we underſtand all purging medicines, Phlebotomie, Scarification, Cauteries, Cuppings, Glyſters, and other ſuch like things as evacuate anie ſtore of the dolorifick matter. But ſuch as are properly termed Anodynes, are of two ſorts: for ſom are temperate, others hot and moiſt in the firſt degree, and conſequently, near to thoſe that are temperate: theſe preſerv the native heat in the proper integritie, thus they amend all diſtemperatures; of this kinde are accounted Sallad oil, oil of ſweet Almonds, the yolks of eggs, and a few other ſuch like things, theſe ſtrengthen the native heat, that thus increaſed in ſubſtance, it may with the more facilitie or'ecom the cauſ of pain: beſides alſo, they rarifie, attenuate, digeſt, and conſequently evacuate both groſs and viſcid humors, as alſo cloudie flatulencies hindred from paſſing forth: ſuch are *flores chamæmeli, meliloti, crocus, oleum chamæmelinum, anethinum, oleum lini, oleum ex ſemine althææ, lumbricorum, ovorum, ex tritico, butyrum, lana ſuccida, ſuillus adeps, vitulinus, gallinaceus, anſerinus, humanus, ex anguilla, cuniculâ, & aliis. Lac muliebre, & vaccinum, mucago ſeminis lini, fænugræci, althææ, malvæ, vel ejuſmodi ſeminum decoctum:* as alſo *Decoctum liliorum, violariæ, capitis, pedum, & inteſtinorum arietis et hædi.*

What properly termed Anodynes are.

Nar-

Narcoticks improperly termed anodynes.

Narcoticks, or ſtupefying medicines, improperly termed Anodynes, are cold in the fourth degree, therefore by their exceſs of cold, they intercept or hinder the paſſage of the animal ſpirit to the part, whence it is that they take away ſenſ: of this ſort are *hyoſcyamus, cicuta, ſolanum manicum, mandragora, papaver, opium, arctiſſima vincula.*

The uſe of them.

You may make uſe of the firſt ſort of Anodynes in all diſeaſes, which are cured by the oppoſition of their contraries: but of the ſecond, to expugn pains that are not verie contumacious, that by their application wee may reſiſt defluxion, inflammation, the fever, and other ſymptoms. But whereas the bitterneſs of pain is ſo exceſſive-great that it will not ſtoop to other medicines, then at the length muſt wee com to the third ſort of anodynes. Yet oft-times the bitterneſs of pain is ſo great that verie narcoticks muſt bee applied in the firſt place, if wee would have the part and the whole man to bee in ſafetie. Yet the two frequent uſe of them, eſpecially alone without the addition of ſaffron, myrrh, *caſtoreum*, or ſom ſuch like thing, uſeth to bee verie dangerous: for they extinguiſh the native heat, and cauſ mortification, manifeſted by the blackneſs of the part. But intolerable pains, to wit, ſuch as are occaſioned by the exceſs of inflammation and gangrenes, may bee ſooner mitigated by opening a vein, purging and ſcarifying the part affected, then either by properly-termed anodynes or narcoticks, to wit, that pain may bee the remedie of pain. By purgers wee here underſtand not onely ſuch, as taken by the mouth, produce that effect; but alſo ſuch as outwardly applied perform the ſame, as thoſe whereof *Aetius* make's mention, As,

Tetrab. 1. ſer. 3. cap. 35.

Purgatives to bee externally applied.

R. *pulpæ ſeu medul. colocynth. ſemin. eruc. rut. ſylveſt. elaterii, gr. cindii, lathyrid. expurgatar. galban. nitri, ceræ, ſingulorum,* ℥ iiii. *opopan.* ʒ ii. *terebinth.* ʒ vi. *terenda terito, et taurino felle paulatim irrigato, donec aptè imbibantur.* Then applie it about the navel even to the ſhare, for thus it will purge by ſtool; if on the contrarie you applie it to the bottom of the ſtomach, it will cauſ vomit. Another; R. *elaterii,* ʒiii. *colocynth. ſcammon. ſquammæ æris, radic. cucumer. agreſt. lathyrid. an.* ʒ i. *aut pro lathyrid. tithymal. ſuccum terito et cribrato, at cum oleo plurimum ſalis habente ſubigito; magnam indè pilam è lana confertam hoc medicamento illitam, umbilico aut lumbis applicato.* Or, R. *fellis taurin.* ʒ. i. *gr. cindii virid.* ℥ iv. *ſucci lupinor. virid.* ℥ ii. *euphorb.* ℥ i. *pulp. colocynth. tantundem adip. vulpin. recent.* ℥ vi. *adip. viper.* ℥ ii ß. *ſtercor. muris,* ℥ iv. *ſucci pæon. caſtor. ſingulor.* ʒ iv. *ol. liguſtrin.* ʒ. vi. *ol. antiq.* ℥ i *fiat unguentum vel oleum.* It purgeth without trouble, and beſides the other commodities it alſo is good againſt diſtraction or madneſs. Two ſpoonfuls is the greateſt quantitie to bee uſed at one time, for in ſom, one is ſufficient: annoint therewith the navel and thereabouts, and a juſt purgation will enſue thereupon, which if it ſhall flie out beyond your exſpectation, you may foment the bellie with a ſponge moiſtened in warm wine and preſſed forth again, it will bee preſently ſtaied. Moreover *Fernelius lib. 7. methodi*, make's mention of a laxative ointment.

The compoſition of a purging oil and ointment.

CHAP. XX.

Of the compoſition and uſe of Medicines.

Hitherto wee have ſpoken of the faculties of ſimple medicines, now wee think good to ſaie ſomthing of the compounding of them: for ſo by the Architect are had and known everie thing apart, and then hee ſettle's the workmen to the building, the conceived form of which hath been in his minde ever ſince hee did enterpriſe it. Therefore the compoſition of divers medicaments with their qualities and effects, is a mingling appointed by the art of the Phyſician. Hence therefore *rheum, aloë, roſa, abſynthium*, although they have divers ſubſtances and faculties, yet are notwithſtanding called ſimple medicines, becauſ they have that varietie from Nature, not from Art. But wee manie times call ſimple ſuch things as are compounded by art, as *oxym. ſimpl. oxyſacch. ſimplex*, as compared to greater compoſitions. And therefore oftentimes wee uſe compound medicines, becauſ alwaies the ſimple medicine alone, hath not ſtrength enough to oppugn the diſeaſ. For manie times the ſick labor with manifold, and not ſimple effects, from which there beeing taken a various indication, wee gather contrarie ſimple medicines, to applie to everie affect, in one compoſition. But oftentimes the nature of the part of the patient, or of the bodie affected, requireth another kinde of medicament which may bee proper for the remooving that diſeaſ; wherefore it is ſo made to oppugn the diſeaſ and not offend the bodie: and wee mingle manie other together, whoſe effects may temper one another. Moreover, the compoſition of medicines was neceſſarie, that becauſ thoſe things which have not a good taſte, color, or ſmell, by art or compoſition, might bee made more grateful. Compound medicines of which we intend to ſpeak, are Glyſters, Suppoſitories, *Noduli*, Peſſaries, Oils, Liniments, Ointments, Emplaſters, Cerats, Pultiſſes, Cataplaſms, Fomentations, Embrocations, Epithemates, Veſicatories, Cauteries, *Collyria, Errhina*, Sneeſing-powders, Maſticatories, Gargariſms, Dentifrices, Bags, Fumigations, Semicupiums, Baths. But firſt it is expedient that I ſaie ſomthing of weights and meaſures, with their notes, by which medicines commonly are meaſured and noted by Phyſicians.

Gal. 2. ſimp. 4. de ſanit. tuend.

The neceſſitie of compound medicines.

CHAP.

CHAP. XXI.

Of weights and measures, and the notes of both of them.

EVerie weight ariseth from a beginning and foundation, as it were; for as our bodies do arise of the four first simple bodies or elements, into which they are often resolved: so all weights do arise from the grain, which is as it were the beginning and end of the rest. Now hereby is understood a barlie-corn or grain, and that such as is neither too drie, or overgrown with mouldiness, or rancid, but well conditioned, and of an indifferent bigness. A grain the beginning of all weight. What is meant by a grain.

Ten grains of these make an *Obolus*; two Oboli, or twentie grains make a scruple, three scruples, or sixtie grains make a dram, eight drams make one ounce, twelv ounces make one pound medicinal, which is for the most part the greatest weight used by Physicians, and which they seldom exceed; and it is resolved into ounces, drams, scruples, *oboli* and grains, which is the least weight. To express these weights we use certain notes, the pound is expressed by this note, lb. the ounce by this ℥, the dram thus ʒ, the scruple thus ℈, the *obolus* with the beginning letter thus *obol.* the grain with his beginning letter thus, g. But sometimes wee measure the quantitie of medicines by measures and not alwaies by weights; and therefore wee express a han dful by this note, m. a pugil thus, p. number thus, n. and the half part of everie weight and measure is expressed by this note, ß. put after everie note of the aforesaid weights and measures of the same sort, as the half pound, lb ß. the half ounce, ℥ß and so of the rest. Moreover, in describing the same medicament we use the notes somtimes of weights, somtimes of measures; and therefore it is to bee noted that herbs, green or drie, are signed with these notes, m. p. but those which are drie and bee brought to powder, with these notes, ℥. ʒ. p. Roots, by these notes, ℥. ʒ. p. m. Barks, by these notes, ℥. ʒ. Seeds, by these notes, ℥. ʒ. Fruits, by these notes, an. p. ℥. ʒ. ℈. Flowers, by these notes, p. m. ℥. ʒ. Pulses, by these notes, p. ℥. ʒ. *Obolus.* A scruple. A dram. An ounce. A pound.

All other medicaments either drie or liquid, are described with these notes, lb. ℥. ʒ. ℈ obol. g.

Having expounded these things, let us come to the description of compound medicines, beginning with glysters first, as the remedie which is most common and familiar, and almost chiefly necessarie of all others.

CHAP. XXII.

Of Glysters.

A Glyster is an injection prepared first and properly for the gross intestines and sunda ment; for somtimes glysters are used and made for the stomach, spleen, reins, bladder, womb, mesenterie, and also for the head, from whence oftentimes by sharp glysters, the hurtfull matter is brought downwards, as wee see in Apoplexies. Therefore there is no part of the bodie which receiv's not som benefit by glysters, but more or less according to the vicinitie they have with the bellie, and the strength of the glyster: for there are divers sorts of glysters, som emollients, other evacuating, som anodynes, som astringents, som cleansing, som sarcotick, and epulotick, and som may bee said to nourish. They may bee all made of the parts of plants or beasts, with compound medicines either solutive, or altering, and others according to the advise of the Physician. The parts of plants which are used to this purpose, are roots, seeds, leavs, flowers, fruits, shouts, juices, mucilages. Parts of beasts are yolks of eggs and whites, honie, chickens, capons, old cocks well beaten, heads and feet of sheep, the intestines, whey, milk, sewet, axungia, and such like in decoctions, wherein wee mingle and dissolv simple and compound medicines. Wee somtimes use without anie other medicament, to make a glyster with oil alone, as oil of nuts for the Colick, of whey alone, the decoction of the head and feet of the sheep alone, and of the decoction of Cicers and barlie do wee prepare glysters. What a glyster is. Differences of glysters. The materials of glysters.

The quantitie of a glyster is somtimes less according to the divers disposition of men and their diseases: for weak children the quantitie is less: for women with child, and in the colick, dysenterie, lyenterie, or when much hardened excrement, is within. But when we would abundantly moov the excrement, and there is nothing that may hinder, the dose of a glyster for the most part is half a pound, one pound, or three quarters of a pound. The glyster must bee injected warm or hot, more or less, according to the nature or condition of the sick: for beeing cold it offend's the intestines, and the neighboring nervous parts, which are cold of themselvs. It must bee given by degrees, for beeing injected suddenly, the winde which is usually in the guts will beat it back again, whence com's intolerable pain. But this will bee more clear by that wee shall teach concerning the differences of glysters, whereof there shall bee sufficient examples. Their quantitie

℞. *malv. violar. bismalv. acanth. an.* m i. *radic. alth. lilior. an.* ℥. i. *passul. ficuum ping.* ℥ ß. *fiat decoctio ap* lb i. *in qua dissolve cass. butyr. recent. an.* ℥ i. *ol. viol.* ℥ iii. *fiat Clyster.* An emollient glyster.

Glysters, that do evacuate, are prepared by the counsel of the Physician, and of divers Simples, being boiled for several purposes. Therefore if the humors bee cold which are to bee

A Glyster to evacuate a cold phlegmatick humor.

bee evacuated, the Glyster shall bee after this manner. R. *Salviæ, origani, abrotoni, chamæm. melilot. an.* m. ß. *seminum anisi, fœnic. cumini, an.* ʒ iii. *semin. cartbar.* ʒii. Make a decoction of them, wherein dissolv *Diapbon. Hier. Simpl. an* ʒß. *ol. anetb. chamæm. an.* ʒi. ß. *Mellis Antbo. succ. rub. an.* ʒ i. *fiat Clyster.*

To evacuate Cholerick matter, prepare a Glyster after this manner. R. *quat. remollient. paret. Cichor. endi. an.* m. ß. *Semen. quat. frigid. Major. an.* ʒiii. *hordei integri.* p. i. Make a decoction of them, and dissolv in it *Cass.* ʒ. i. *Ol. viol. mellis viol. an.* ʒ ii. *fiat Clyster.*

To evacuate melancholie, this Glyster following will bee useful. R. *Fumiter. Centaur. minoris, Mercurialis, an.* m. i. *Polyp. Qu. folicul. sennæ, an.* ʒ iii. *seminis agni casti, Thymi, an.* ʒ ii. Make a decoction and dissolv therein, *Confect. Hamech.* ʒ ß. *Cass. recens extract.* ʒ iii. *olei violati, lilior, an.* ʒß. *Succ. rub. mellis viol. an.* ʒiß. *salis,* ʒi. And those Glysters do not onely evacuate the humors that offend, but also correct the distemper of the bowels and inward parts. For the Glysters described against pitutious and melancholick matter, help the cold distemper; but that which is for choler, the hot distemper. Purging medicines, which are dissolved in the decoction of Glysters, are verie strong, as, *Confect. Hamech. Benedicta, Diaprun. Solutivum, Diaphœnicon,* beeing used from ʒ.vi. to ʒi. at most: but the weaker and more gentle are *Catholicon. Cassia, Hiera simplex,* from ʒvi. to ʒii. at most..

An Anodyne Glyster.

An Anodyne Glyster is usually made without such things as purge or evacuate: as, R. *Flor. Chamæm. melil. Anetb. an.* p. i. *rad. Bismal.* ʒi. boil them in Milk, and to the decoction add *Mucaginis seminis lini fœnugræci extractæ in aqua Malvæ* ʒii. *saccari albi, olei anethi, chamæmeli, an.* ʒi. *vitellos ovorum duos, fiat Clyster.* These Glysters should bee kept longer in the bodie, that so they may more easily mitigate pain. *The example of an astringent Glyster.*

An Astringent Glyster.

R. *Equi seti plantag. poligami. an.* m. i. boil them *in lacte ustulato,* to ʒxii. to the decoction strained add *Bole armeni, sanguinis draconis, an.* ʒii, *olei rosati,* ʒii. *album. ovorum duorum, fiat Clyster.* Wee use these kinde of Glysters in Dysenteries, and in the immoderate flux of the Hæmorhoid veines, having first evacuated the usual excrements. Glysters, which be sarcotick, epulotick, and cleansers of the greater guts, and fit for the curing of ulcers, are to bee prepared of such medicines as are described before in their proper Chapters.

Nourishing Glysters.

Alimentarie Glysters are made of the decoction of Chickens, Capons, Cocks, beeing boiled to a gellie, and strongly prest forth. They are also prepared of Marrow, gellie, which are not altogether so strong as those which are commonly taken by the mouth, becaus the facultie of concoction in the guts, is much weaker then that of the stomach. Oftentimes also the matter of these kinde of Glysters are prepared in wine, where there is no pain of the head or fever, but more frequently in the decoction of Barlie, and in Milk, adding the yolks of Eggs, and som small quantitie of white sugar, lest by the cleansing facultie it move the guts to excretion. And therefore Sugar of Roses is thought better, which is conceived to somwhat binding. Here you may have example of such Glysters. R. *Decoctionis Capi perfectè cocti* lb. i. ß. *saccari albi,* ʒß. *misce, fiat Clyster.* R. *Decocti Pulli & Galatinæ, an.* lb. ß. *vini opt.* ʒiv. *fiat Clyster.* R. *Decocti hordei mundati, & in cremorem redacti* lb. ß. *lactis boni* lb. i. *Vitellos ovorum duos, fiat Clyster.*

Their use.

We use these kinde of Glysters to strengthen children, old and weak men, and bodies which are in a Consumption. But in the use of these there are three things to bee observed: First, that the fæculent excrements may bee taken away, either by strength of nature, or by art, as by a suppositorie, or an emollient Glyster, lest the alimentarie matter beeing mingled with them, should so bee infected and corrupted. The other is, that there bee great quantitie given, that so som may assend to the upper guts. The third is, that the sick sleep after the taking of it; for so it is more easily converted into nourishment, and the elementarie matter is better kept: for sleep hindereth evacuations. In Glysters of this kinde wee must beware of Salt, Honie, and oil; for the two first provoke excretion by their acrimonie, and the last by his humiditie doth relaxate and lubricate. They, who think no kinde of Glyster can nourish or sustein the bodie, relie upon this reason: That it is necessarie whatsoever nourisheth, should have a triple commutation or concoction in the bodie: first, in the stomach; second in the liver: thirdly, in all the members. But this opinion is repugnant to reason and experience: to reason, for that a certain sens of such things as are defective, is implanted in all and everie of the natural parts of our bodie. Therefore seeing nutrition is a repletion of that which is emptie, without doubt the emptie and hungrie parts will draw from anie place that nourishment that is fit and convenient for them, and in defect thereof, whatsoever they meet with, which by anie familiaritie may asswage and satisfie their desire. But the alimentarie Glysters, by us described, consist of things which agree verie well with the nature of our bodies, and such as are boiled and ordered with much art, so to applie the chylification to bee performed in the stomach. Therefore they may bee drawn in by the meseraick veins of the guts; which according to *Galen,* have a certain attractive facultie. And thence they may bee easily carried through the gate-vein, liver, and so over the whole bodie. And experience teacheth, that manie sick people, when they could take nothing by the mouth, have been susteined manie daies by the help of these kinde of Glysters. What is more to bee said? Wee have seen those who have taken a Suppositorie by the fundament, and vomited it at the mouth; by which it also appeareth, that som-

Their Argument that denie Glysters to nourish.

Confuted first by reason.

Secondly, by experience.

something may flow without danger of the sick from the guts into the stomach.

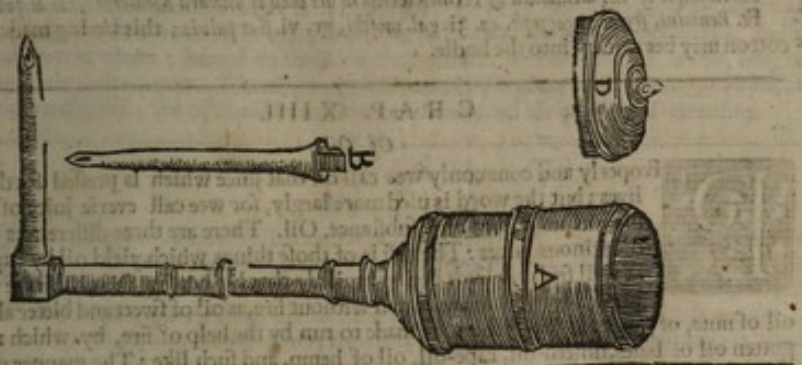
Commonly they give Glysters anie hour of the daie, without anie respect of time, but it should not bee don unless a great while after meals, otherwise the meat, being hindered from digestion, will bee drawn out of the stomach by the Glyster.

Glysters are used to help the weaker expulsive faculties of the guts, and by consequence also of the other parts, both that such as through want of age, and old people, and such as by reason of great imbecilitie by sickness cannot admit of a purging medicine, may by this means at least eas themselvs of the trouble and burden of hurtful humors. *Galen* hath attributed to Storks the invention of Glysters, which with their bils, having drunk Sea-water, which from saltness hath a purging qualitie, wash themselvs by that part, whereby they use to bring away the excrements of their meats, and of the bodie. But a Glyster is fitly taken after this manner: whilest the Syringe is expressed, let the patient hold open his mouth; for by this means all the muscles of the *Abdomen*, which help by compression the excretion of the guts, are relaxed. Let him wear nothing that may gird in his bellie, let him lie upon his right side, bending in a semicircular figure; and so the Glyster will the more easily pass to the upper guts, and (as it were) by an overflowing, wet and wash all the guts and excrements. It hap'neth otherwise to those who lie upon their left side; for the Glyster beeing so injected, is conceived to abide, and (as it were) to stop in the *Intestinum rectum*, or *Colon*, becaus in this site these two intestines are oppressed, and as it were shut up with the weight of the upper guts. A little while hee may lie upon his back after hee hath received the Glyster, and presently after hee may turn himself on either side. And if there bee pain in anie part, so long as hee is able hee may incline to that side. Moreover, becaus there are manie who cannot by anie reason bee perswaded to shew their buttocks to him that should administer the Glyster, a foolish shamefastness hindering them: therefore I thought good in this place to give the figure of an Instrument, with which one may give a Glyster to himself, by putting up the pipe into the fundament, lifting the buttocks a little up. The pipe is marked with this letter *A*. The bodie of the Syringe, whereinto the Glyster must bee put, with this Letter *B*.

The common use of glysters.

The sick having received the glyster, must turn to their side grieved.

The figure of a Glyster pipe and Syringe, by benefit whereof a man may give himself a Glyster.



CHAP. XXIII.

Of Suppositories, Nodules, and Pessaries.

A Suppositorie is a certain medicament, formed like unto a tent, or gobbet of paste, such as is commonly used to fat Fowl. It is put into the fundament, that it might excite the sphincter-muscle to send forth those excrements which are knit in the guts. Antiently it had the form of an Acorn, whence it is called to this daie *Glans*. The Suppositories, wee now usually make, have the form of a Pessarie, that is round and longish, in the form of a wax-Candle. They are either weak, stronger, or sharp; the weak are made of the stalks or the roots of Beets, of Lard, boiled Honie with Salt, or of Castle-sope. The stronger of purging powders, as, *Hiera* with Salt and Honie. The sharp with Scamonie, *Euphorbium*, *Coloquintida*, and like things powdred, and with Honie, or the juices of sharp herbs, or mingled with the gals of beasts. It is commonly made thus: as, R. *Mellis* ℥i. *Salis aut pulveris alterius irritantis* ℥i.

The differences.

The form.

R. *Mellis cocti* ℥i. *pul. Colocynthidos* ℈ ß, *Salis gemmæ* ℈i. *fiat Suppositorium.* Wee use Suppositories, when the sick by his infirmitie is unwilling, or not able to bear or away with a Glyster, as in burning Fevers: or, when as one beeing injected, is slow, and resteth in the guts. And wee use the sharper Suppositories in soporiferous affects of the head, that they might provoke the dull faculties of the guts to expulsion. As also, when the condition of the dis-

The use.

eas is such, that by the use of Glysters there is manifest hurt; as, in an *Enterocele*, where the gut so swel's, that over and above it bee filled by the glyster infused, it would the more prest the *Peritonæon*, so that straight-waies by the relaxed or broken part it might easily bee devolved into the Cod.

Nodules have the same use with Suppositories, and are oftentimes substituted in stead of Glysters. They are made of gentle medicines, as the yelks of Eggs with a little Salt and Butter, or of Gall and Honie tied up in a cloth in the form of a Filbert, the string of it may hang forth, whereby the Nodule in the fundament may bee drawn forth. This description may bee an example of Nodules: ℞. *Vitellum unius ovi, cui adde salis modicum, fellis vervecis, mellis an.* ʒß. *butyri* ʒiii. *misce, fiant Noduli filo appensi.*

The form of a Nodule.

Pessaries.

A Pessarie is grosser than a Suppositorie, and is appointed for the womb, beeing made with Cotton-wool or Silk steeped in som medicament, and then put into the neck of the womb.

Their use.

A pessarie is used either to ulcers of the neck of the womb, or for the procuring or stoping of the *Menstrua*, or against sordid and hurtful humors of the womb causing hysterical passions, and therefore to bee wasted away and evacuated. Therefore in the composition of pessaries are used gums, juices, seeds of herbs, roots, and manie other things, according to the advise of the Physician; they are also made of a solid consistence, the bigness of a finger, that they may enter into the neck of the womb; these beeing tied with a string, which must hang forth to pluck it out withal when evasion serv's. This following may bee an example of their description. ℞. *myrrh. aloes, an* ʒ i. *sabin. semin. nigel. arthemis. an.* ʒii. *radic. ellebor. nig.* ʒi. *croci,* ℈ i. *cum succo mercurial. & melle fiat pessus*; let it bee tied to the thigh with a thred. Or thus, ℞. *mastich. thurii, an.* ʒ iii. *alum, ros. rub. nuc. cupres. an.* ʒii. *balaust. hypoci. sumach, myrtil. an.* ʒ iii. *fiant pessi cum succo arnoglos. & cotoniorum.* According to this example others may bee made for to mollifie, to binde, to cleans, to incarnate, to cicatrize and cover the ulcers of the womb: they are to bee put up when the patient lieth in bed, and to bee kept all night.

Pessaries are also made of medicinable powders, not onely mixed with som juice, but also with those powders alone beeing put into a little bag of som thin matter, beeing stuffed with a little cotton that it might bee of a convenient stifnes, and this kind of pessaries may bee used profitably in the falling of the mother.

An example of one mentioned by Rondeletius *in his book of inward Medicines, is as followeth.*

Against the suffocation of the Mother.

℞. *Benioini, styracis, caryoph. an.* ʒi. *gal. moschi,* gr. vi. *fiat pulvis*; this beeing made up with cotton may bee put up into the bodie.

CHAP. XIIII.

Of Oils.

PRoperly and commonly wee call oil that juice which is pressed forth of Olives; but the word is used more largly, for wee call everie juice of a fluxible, unctuous, and airie substance, Oil. There are three differences of these oleaginous juices: The first is of those things which yield oil by expression, as well fruits as seeds beeing bruised, that by beating the oilie juice may bee pressed forth: som are drawn without fire, as oil of sweet and bitter almonds, oil of nuts, of *palma Christi*. Others are made to run by the help of fire, by which means is gotten oil of baies, linseed-oil, rape-oil, oil of hemp, and such like: The manner of drawing oil from seeds is set down by *Mesue* in his third book.

The making oils by infusion

The second sort of those oils which are made by the infusion of simple medicines in oil, wherein they leav their qualities: and this is don three several waies, the first is by boiling of roots, leavs, tops of flowers, fruits, seeds, gums, whole beasts, with wine, water, or som other juice, with common or anie other oil, until the wine, water, juice bee consumed, which you may perceiv to bee perfectly don, if you cast a drop of the oil into the fire, and it maketh no noise but burneth. It is to bee remembred that somtimes the seeds or fruits are for a certain time to bee macerated before they are set to the fire, but it must bee boiled in a double vessel, lest the oil partake of the fire.

After this manner is made *oleum costinum, rutaceum, de croco, cydoniorum, myrtillorum, mastichinum, de euphorbio, vulpinum, de scorpionibus*, and manie others. The second is by a certain time of maceration, som upon hot ashes, others in horse-dung, that by that moderate heat the oil might draw forth the effects of the infused medicines into it self. The third is by insolation that is, when these or these flowers, beeing infused in oil, are exposed to the sun, that by the heat thereof the oil may change, and draw into him self the facultie of the flowers which are infused: of this kinde are oil of roses, camomil, dill, lilies, of water-lilies, violets, and others, as you may see in *Mesue*.

The manner of oils by resolution.

The third kinde is properly that of the Chimists, and is don by resolution made after divers manners, and of this sort there are divers admirable qualities of divers oleaginous juices, whether they bee made by the sun or fire, or putrefaction, as wee shall speak in his place hereafter.

Wee

Wee use oils when wee would have the virtue of the medicament to pierce deep, or the substance of the medicines mingled with the oil to bee soft and gentle. Moreover, when wee prepare oils that should bee of a cooling qualitie, the common oil of the unripe Olive is to bee used: of that should the oil of roses bee made.

Again, when wee would prepare oils of heating qualities, such as are *Oleum philosophorum*, or of Tiles, sweet and ripe oil is to bee chosen.

CHAP. XXV.

Of Liniments.

A Liniment is an external medicine of a mean consistence, between an oil and an ointment, for it is thicker then an oil; for besides oil it is compounded with butter, axungia and such like, which is the reason why a liniment is more efficacious in ripening and mitigating pain, then simple oil. The varieties of liniments are drawn from their effects, som cool, others heat, som humect, som ripen, others by composition are made for divers uses. The matter whereof they are usually made, is oil, axungia, suet, butter, all those things which have an oilie substance or consistence, as *styrax liquida*, turpentine, the mucilages of fenugreek, marsh-mallows, marrow, and other like. To these are somtimes added powders of roots, seeds, flowers, rindes, metals, but sparingly, that the liniment may bee of a liquid consistence. What a liniment is.

An example of a liniment that is good to attenuate, heat, and digest, is this that followeth.

℞. *ol. amygd. amar. lilior. an.* ℥i. *axung. anat. gallin. an.* ℥ß. *butyr. sal expert.* ℥i. *mucag. sem. altb. fænugr. extract. in aq. byssop. an.* ℥ ß. *pulver. croci, irios, an.* ℈i. *fiat linimentum.*

This may bee an example of a liniment to humect and mollifie.

℞. *ol. amygd. dulc.* ℥ii, *axung. human.* ℥ ß. *mucag. semin. malv. extract. in aq. parietar.* ℥ ß. *fiat linimentum:* you may add a little saffron. There bee manie others like these which ma y bee made for divers affects. They are easily applied to everie part of the bodie, becaus they are not so liquid as oils: the reason is, they are more agreeable to anie of the parts. If they bee to enter into anie crooked narrow passage, such as the ear, they must bee more liquid, and have more oil: if they bee to stick on the part, they will admit of more axungia and suet.

They are deceived who think that the difference between liniments and ointments is, that there is no wax in liniments as there is in unguents; for there bee som unguents which admit not anie wax to bee added, as *ægyptiacum*, and all such as are used in gangreens, and all sorts of putrid ulcers; becaus to these kinds of diseases all fattie things, as oils, fats, rosins, and wax, are enemies. Therefore wee substitute in the place of them in *ægyptiacum*, honie and verdigreas; for of these it hath his consistence, and his qualitie of cleansing.

CHAP. XXVI.

Of Ointments.

Ointments are of a more solid consistence then Liniments, and are therefore of more force. Their differences ate partly taken from their effects; for som heat, others cool, som drie, and som humect, som cleans, som corroborate, som waste dead flesh, and others cicatrize, partly from the varietie of colors, partly from the first invertors, as *Album rhasis*, *Desiccativum rubrum*: partly from the number of the simple medicaments whereof they bee made, as, *Tetrapharmacum*, *Tripharmacum*, or *Nutritum*: partly from that medicament which is principal in the composition, hence are they called, *Unguentum de Lythargyro*, *de Minio*, *Diapompholigos*, and such like. They are compounded of herbs, roots, seeds, fruits, metals, and part of Beasts; the juices and other liquid things beeing consumed away by boiling, as wee have said in the Chapter of compound Oils. Herbs, and the parts of them, if they bee drie, must bee powd'red, and also metals; but beeing green, they are boiled and strained forth, and the juice so pressed is wasted by boiling. Gums and Rosins som are powdred, others beeing put to som convenient liquor are dissolved by fire: So wax is dissolved in the Oil. In the composition of unguents this proportion is usually observed, that for one ounce of powder, two ounces of Wax, and eight of oil is added: notwithstanding for that Wax serveth onely to the consistence of the ointment, it is better to leav the quantitie to to the will of the Apothecarie; but hee may bee more sparing in adding Wax to the ointments in Summer then in winter, for the heat of Summer, drying them, addeth to the consistence; by examples propounded, these common precepts will more plainly appear. Ointments and their differences.

℞. *Olei ros.* iv. *pil. lepor. bol. armen. terræ sigil. an.* ℥i. *bal. Gallar. an.* ℥ß. *tritis terendis, & simul mixtis, additâ cerâ quod sufficit, fiat unguentum.* Here wee must observ, that there bee three waies of making ointments: The first is of those which are made onely by stirring or grindeing in the Mortar without anie fire, and so is made *Unguentum nutritum*. The second is, when wee dissolv Wax in Oil, Fat, or som such substance with fire: and beeing all dissolved, wee mingle the powders according to the proportion wee noted before. After which manner are made *Unguentum Aureum*, *Basilicon*, *Diapompholigos*, *Desiccativum rubrum*, *Exulatum*. *unguentum adstringens.*

Enulatum. The third ſort is, when wee bruiſe herbs with a Peſtell, and mingle them with Axungie, boiling them together, and then ſtraining them, and the ointment is that which is ſtrained. Therefore let us proceed to explain this by examples.

unguentum nutritum. R. *Lythar. auri triti & loti* ℔ß. *olei roſ.* ℔i. *aceti roſ.* ℥iv. *fiat Unguentum.* Firſt, wee put the Lytharge into the Mortar, powring in a little Oil, and working it with a Peſtil, that it may grow thick, then with the Oil wee put a little Vineger, continually working, until they mingle into one bodie, now and then between whiles adding ſomtimes a little Oil, ſomtimes a little Vineger, until the whole bee brought to the conſiſtence of an ointment. If of an ointment of this kinde thou wouldeſt make a black plaſter, by degrees conſume all the Vineger, ſo ſhall the plaſter ſhine and grow black.

unguentum aureum. R. *Ceræ citr.* ℥vi. *olei boni* ℔ii. *tereb.* ℥ii. *reſin. & coloph. an.* ℥iß. *olib. maſtich. an.* ℥i. *croci,* ℥i. *fiat Unguentum.* Firſt, diſſolv the Wax with a good part of Oil, then add the Roſin and Colophonie broken ſmall. Theſe beeing diſſolved, take the compoſition from the fire, and then add the Turpentine; when the whole is ſomwhat cooled, add the *Olibanum* and Maſtick beeing finely powdred, then the Saffron, which ſhall bee macerated in the reſt of the Oil.

ung. Tetrapharmacum, ſeu Baſilicum. Tetrapharmacon is ſo called, becauſ it is made of four ſimple medicines, Wax, Roſin, Pitch, Tallow, of each a like qnantitie, and ſo equally mixed.

R *Reſin. picis nigr. adip. vituli. & ceræ an* ℥ii. ß. *Olei veteris olivarum maturarum,* lb. i. ß. or if you would have it harder, lb. i. that ointment is alſo called *Baſilicon*, the Wax beeing cut ſmall and diſſolved in Oil, then add the reſt of the things, which beeing diſſolved, thou ſhalt have the deſired ointment.

ung. Diapempholygos. R. *Olei roſ.* ℥ix. *cer. alb.* ℥iii. *ſucci ſolani hortenſis*, ℥iv. *Ceruſ. lot.* ℥i. *Pompholygos, plumbi uſti & loti, olib. puri, an.* ℥ß. *fiat unguentum.* Diſſolv the Wax in the Oil with a gentle fire, then you ſhall take it from the fire, and add to the reſt of the ingredients, working them together in a ſtone-Mortar, powring on the juice by degrees, at leaſt ſo much of it as will incorporate.

ung. deſiccativum rubrum. R. *Lap. calam. ter. ſig. an.* ℥ii. *Litharg. auri, ceruſ. an.* ℥iß. *Camphor.* ʒß. *ceræ,* ℥iiß. *Olei roſat. viol. an.* ℥iii. *fiat Unguentum.* Diſſolv the Wax in the Oyl, then ſet it to cool, and work in the powders with a ſpatter, and at laſt add the Camphir diſſolved in a little Oil of Roſes, or Roſewater.

ung. Enulatum. R. *Rad. enul. campan. cocti. cum aceto & contuſ. ut decet* lb. ß. *Axung. porci, olei commu. an.* ℥iß. *argen. vivi exſtinctii, et tereb. lot. an.* ʒi. *ſal. commu. pulverati,* ʒii. incorporate them according to art. The boiled roots muſt bee drawn through a Sieve, which beeing boiled by a gentle fire with the *Axungia*, muſt bee continually ſtirred, then put to the Salt with Oil and Wax: when you ſet it from the fire to cool, then add the Quickſilver, beeing killed with a little *Axungia* and Turpentine.

ung. Album Rhaſis. R. *Olei roſat.* ℥ix. *ceruſ. alb.* ℥iii. *cer. alb.* ℥ii. make it thus: Let the Ceruſs bee finely powdred, and put into the Oil and Wax whil'it it is hot, and ſo work the whole together, until they ſhall bee brought into a bodie.

De Althæa. R. *Rad. Alth.* lb. i. *ſemi. lini, fœnugr. an.* lb. ß. *Scillæ* ℥iii. *Olei com.* lb ii. *cer.* lb. ß. *terebinth. gum. heder. galb. an.* ℥i. *coloph et reſin.* ℥iii. The roots and ſeeds beeing bruiſed, are infuſed for three daies in five pints of water; boil them until three ounces bee conſumed, and then draw forth the Mucilage, and boil it with the Oil, then add Wax cut ſmall: theſe beeing taken from the fire, the *Galbanum* beeing diſſolved with Vineger, and mingled with the Turpentine, muſt bee added together with the Gum *Hederæ*, Colophonie, and Roſin.

ung. Populeum. R. *Ocul. populi arb.* lb. i ß. *fol. papaveris nigr. Mandrag. hyoſcami, lactucæ, ſempervivi parvi et magni, violæ nigræ, ſolani, umbilici veneris, ſeu cymbalar. bardanæ, an.* ℥ ß. (*Cordus, Fernelius, et Nicolaus ſingulorum* ℥iii. *præſcribunt*) *Adipis ſuilli recentis ſalis expertis,* lb. ii. *vini boni,* lb. i. *fiat Unguentum.* The Poplar buds and Violet leavs muſt bee bruiſed and macerated in the *Axungia* for the ſpace of two moneths, that is until the reſt of the herbs bee readie; for they cannot bee gathered before the Summer time, but the Poplar buds and Violets may bee had in March. They muſt bee bruiſed and mingled verie well, and ſet in a warm place for eight daies; then add one pint of ſtrong Vinegar, and boil them till it bee conſumed, which may bee perceived by caſting a little of it into the fire, then ſtrain it forth, & put up the Ointment.

ung. Apoſtolorum. R. *Tereb. cer. alb. reſ. an.* ʒxiv. *Opopanacis, floris, ſeu viridis æris (nam hic flos æris non propriè accipitur pro granulis, quæ ſcintillarum inſtar ab ære exiliunt dum à fabris ferrariis aqua tingitur: ſed pro viridi æris uſurpatur, cujus contra maligna ulcera notæ ſunt vires, contra quæ omnino id Unguentum eſt comparatum) an.* ℥ii. *ammon.* ʒxiv. *ariſtol. lon. thuris maſculi an.* ʒvi. *myrrhæ et galbani an.* ℥iii. *bdelli,* ʒvi. *Lythary.* ʒix. *olei* lb. ii. *fiat Unguentum.* The Litharge is to bee mingled with two ounces of Oil for the ſpace of five hours, and with a gentle fire to bee boiled until it com to the conſiſtence of honie, and bee alwaies ſtirring, leſt it burn: beeing taken from the fire and warm, the Wax and the Roſin, beeing diſſolved, with the reſt of the oil, muſt bee added. Then put to it, when it is cooling, the Gums diſſolved in Vineger, boiled and incorporated with the Turpentine. Then the *Ariſtolochia*, Myrrh, and Frankincenſ are to bee mingled, and laſt of all the Verdigreaſ, beeing in fine powder, and ſprinckled in: and ſo the unguent is made.

Comitiſſa. R. *Cortic. median. caſtan. cortic. median. querc. cortic. median. gland. mirtil. equeſ. cortic. fabar.*

acinor.

acinor, uvar. ſorbor. ſiccor. immatur. meſpillor, immaturor. rad. chelidon. folior. prunor. ſylveſt. an. ℥ iß. *Aquæ plantaginis,* ℔ viii. *cer. nov.* ℥viii ß. *olei myrtillor.* ℔ iiß. Then theſe things which follow, beeing finely powdred, are to bee ſprinkled in.

℞. *Pulveris corticis mediani caſtan. corticis mediani gland. cortic. median. arb. gland. id eſt, querc. gallar. an.* ℥i. *Cineris oſſ. cruris bovis, myrtill acinor. uvar. ſorbor. ſiccor. an.* ℥ ß. *Trochiſcorum de carabe,* ℥ii. *fiat Unguentum.* Firſt, make a decoction *corticis mediani arboris quercûs, acini uvar. rad. chelid. meſpil. ſorbor. equiſ. ſeminis myrtil. folior. pruni ſylveſtris. cort. fabar. cortic. mediani gland. cortic. caſtan. & gallar.* in the Plantain water for the ſpace of two hours, then ſtrain it, and divide the liquor into nine parts, waſhing the Wax, diſſolved with the oil of Myrtils ſeven times; the liquor beeing all ſpent, and the Wax and Oil beeing melted, then inſperge the powders, *Cruris bovis, aſſium, cortic. median. querc. median. cortic. gland. caſtan. gallar ſorbor. meſpil. ſeminum myrtil. acinor. uvar.* and at the laſt the Trochiſces *carab.* after this manner ſhall you make this Ointment.

℞. *Olei abſinth, maſticb. de ſpic. roſat. an* ℥ß. *pulver. abſinth. roſ. major. menth. an.* ℥i. *Caryoph. cinam. maſticb. galang. an.* ℥i. Powder thoſe things which are to bee powdred, and with a ſufficient quantitie of Wax make a ſoft ointment, wherewith let the ſtomach be annointed one hour before meals continually. *Ung. proſtomachicum.*

℞. *Cer. alb.* ℔ ii. *ceruſ. litharg. auri, an.* ℔ i. *myrrh. medul. cervi, an.* ℥ii. *thuris,* ℥i. *olei,* ℔ ß. Boil the Litharge in the oil to a mean conſiſtence, then add to the Wax and Ceruſs, and when it will not ſtick to the fingers, take it from the fire, and put in the *Medulla*, when it beginneth to cool, the *Myrrha* and *Thus*, beeing finely powdred, muſt bee caſt in by little and little, and the ointment may bee put up for uſe. The chops of the fundament, and remollient Peſſaries are likewiſe made of it, and it is verie good againſt the bitings of mad Dogs, and the punctures of nervs and tendons, keeping wounds ſo that they do not agglutinate. *Ung. ad morſus rubidos, ex li. 2 Gal. de comp. ſec. genera.*

℞. *Picis pinguis,* ℔ i. *Opopanacis in aceto forti, olco liliorum, & veteri porci axungia cocti,* ℥iß. *fiat Unguentum. Oleum ex ſinapi* is good againſt thoſe bitings of mad beaſts and punctured nervs: for it doth open wounds when they are cicatrized. Ointments are uſed to overcom the contumacie of a ſtubborn evil by their firm and cloſe ſticking to, eſpecially if there ſhall need no medicine to go further into the bodie. *3. De comp. med. ſec. gen.*

CHAP. XXVII.

Of Cerats and Emplaſters.

SUch affinitie there is in the compoſition of a Cerat and Emplaſter, that oftentimes the one is taken for the other, as is uſually done in Ointments and Liniments. A Cerat is a compoſition more ſolid and hard then an ointment, and ſofter then a plaſter, having his name from Wax, which taking away the fluidneſs of the oil, bringeth him to his conſiſtence. The differences of Cerats are taken ſom from the parts by which they are called, as *Ceratum ſtomachicum*: ſom from the effects, as *Ceratum refrigerans Galeni*: Others from the ſimple medicaments which are the chief in the compoſition, as *Ceratum Santalinum.* The proper matter of Cerats is, new Wax and Oils, beeing appropriated to the grief of theſe, or thoſe parts; ſo that Liniments and Ointments do ſcarce differ from Cerats, if they admit of Wax: for if ointment of Roſes ſhould have Wax added to it, it were no longer an Ointment but a Cerat. What a Cerat is. The differences.

Cerats, which are made with Roſins, Gums, and Metals, do rather deſerv the names of Emplaſters then Cerats. And therefore *Ceratum ad Hernias*, wee commonly call *Emplaſtrum contra Rupturam.* If that pain or inflammation do griev anie part, wee make Cerats of plaſter, diſſolved with Oil, leſt that the more hard and heavie conſiſtence of the Emplaſter ſhould bee troubleſom to the part, and hinder perſpiration: and therefore laying aſide the compoſition of Cerats, let us ſpeak of Emplaſters.

An Emplaſter is a compoſition which is made up of all kinde of medicines, eſpecially of fat and drie things, agreeing in one groſs, viſcous, ſolid, and hard bodie ſticking to the fingers. The differences of Emplaſters are taken from thoſe things, which the varietie of ointments are taken from. Of thoſe things which go into the compoſition of an Emplaſter, ſom are onely uſed for their qualitie and facultie, as Wine, Vinegar, Juices. Others to make the conſiſtence, as Litharge (which, according to *Galen*, is the proper matter of Emplaſters) Wax, Oil, and Roſin. Others bee uſeful for both, as Gums, Metals, parts of beaſts, Roſin, Turpentine to digeſt, to cleanſ, and drie. Of Emplaſters, ſom are made by boiling, ſom are brought into a form without boiling; thoſe which bee made without fire, do ſuddenly drie, nor are they viſcous: they are made with meal and powder, with ſom juice, or with ſom humid matter mingled with them. But plaſters of this kinde may rather bee called hard ointments, or cataplaſms: for plaſters properly ſo called are boiled, ſom of them longer, ſom ſhorter, according to the nature of thoſe things which Emplaſters.

which make up the compoſition of the Emplaſter: Therefore it will bee worth our labor to know what Emplaſters do ask more, or which leſs boiling. For roots, woods, leavs, ſtalks, flowers, ſeeds, beeing dried, and brought into powder, are to bee added laſt, when the plaſter is boiled as it were, and taken from the fire, leſt the virtue of theſe things bee loſt. But if green things are to bee uſed in a compoſition, they are to bee boiled in ſom liquor, and beeing preſſed forth, that which is ſtrained to bee mingled with the reſt of the compoſition; or if there bee juice to bee uſed, it is to bee bruiſed and preſſed forth, which is ſo to bee boiled with the other things, that nothing for the qualitie is to remain with the mixture, as wee uſe to do in *Empl. de Janua, ſeu Betonica, & Gratia Dei.* The ſame is to bee don with Mucilages, but that by their clammineſs they do more reſiſt the fire. But there doth much of oil and honie remain in their plaſters when they are made. Thoſe juices which are hardened by concretion, as, *Aloes, Hypocyſtis, Acacia,* when they are uſed in the compoſition of a plaſter, and bee yet new, they muſt bee macerated and diſſolvęd in ſom proper liquor, and then they are to bee boiled to the conſumption of that liquor. Gums, as, *Opopanax, Galbanum, Sagapænum, Ammoniacum,* muſt bee diſſolved in Wine, Vinegar, or *Aqua vitæ,* then ſtrained and boiled to the conſumption of the liquor, and then mixed with the reſt of the plaſter. And that they may have the exact quantitie of Gums and Pitch, it is neceſſarie that firſt they bee diſſolved, ſtrained, and boiled, becauſ of the ſticks and ſordid matter which are mingled with them. You muſt have reſpect alſo to the liquor you uſe to diſſolv them in; for Vinegar of the beſt Wine doth more powerfully penetrate, then that which is of weak and bad Wine.

Other Gums, which are drier, are to bee powdred, and are to bee mingled with plaſters laſt of all. Metals, as, *Æs uſtum, Chalcitis, Magnes, Bolus Armenus, Sulphur, Auripigmentum,* and others, which may bee brought to powder, muſt bee mingled laſt, unleſs adviſe bee given by long boiling to dull the fierce qualities of them. The like conſideration is to bee had of Roſin, Pitch, and Turpentine, which muſt bee put in after the Wax, and may not bee boiled but verie gently; but the fats are mingled whil'ſt the other things are boiling. The Litharge is to bee boiled with the oil to a juſt conſiſtence, if wee would have the plaſter drie without biting. Ceruſs may endure as long boiling, but then the plaſter ſhall not bee white, neither will the Litharge of ſilver make a plaſter with ſo good a color as Litharge of gold. Moreover, this order muſt bee obſerved in boiling up of plaſters: the Litharge muſt bee boiled to his conſiſtence; juices or mucilages are to bee boiled away, then add the fats, then the drie Roſin, Wax, Gums, Turpentine, and after them the powders: You ſhall know the plaſter is boiled enough by his conſiſtence, groſs, hard, glutinous, and ſticking to the fingers, beeing cooled in the air, water, or upon a ſtone. Alſo you ſhall know it by his exact mixtion, if that all the things becom one maſs hard to bee broken.

Signs of a plaſter perfectly boiled.

The quantitie of things to bee put into plaſters.

The quantitie of things which are to bee put into a plaſter can hardly bee deſcribed, but an artificial conjecture may bee given, by conſidering the medicaments, which make the plaſter ſtiff, and of a conſiſtence, and the juſt hardneſs and ſoftneſs they make beeing boiled. Wax is not put into ſuch plaſters wherein is *Ladanum*; for that is in ſtead of Wax. For if there ſhall bee in the compoſition of a plaſter ſom emplaſtick medicaments, the Wax ſhall bee the leſs: Contrariwiſe, if they ſhall bee almoſt all liquid things, the Wax ſhall bee increaſed ſo much, as ſhall bee neceſſarie for the conſiſtence of the plaſter. The quantitie of the Wax alſo muſt bee altered according to the time, or the air; therefore it is fit to leav this to the art and judgment of the Apothecarie. Emplaſters are ſomtimes made of ointments by the addition of wax, or drie roſin, or ſom other hard or ſolid matter. Som would that a handful of medicaments poudred, ſhould bee mingled with one ounce, or an ounce and an half of oil, or ſom ſuch liquor, but for this thing nothing can certainly bee determined: Onely in plaſters deſcribed by the Antients there muſt bee great care had, wherein hee muſt bee verie well verſed, who will not err in the deſcribing the doſe of them; and therefore wee will here give you the more common forms of plaſters.

Empl. de Vigo with Mercurie.

℞. *ol. chamæm, aneth. de ſpica, liliacei, an.* ℥ ii. *ol. de croco,* ℥ i. *pingued. porci,* ℔ i. *pingued. vitul.* ℔ ß. *euphorb.* ℥ v. *thuris,* ℥ x. *ol. lauri,* ℥ i ß. *ranas. viv.* nu. vi. *pingued. viper. vel ejus loco human.* ℥ ii ß. *lumbricor. lotor. in vino,* ℥ iii ſ8. *ſucci ebuli, cnul. ana.* ℥ ii. *ſebennanthi, ſtæchados, matricar. an.* m ii. *vini oderiferi,* ℔ ii. *litharg auri,* ℔ i. *terebinth. claræ,* ℥ ii. *ſtyracis liquid.* ℥ i ſ8. *argenti vivi exſtinčti,* ſo much as the preſent occaſion ſhall require, and the ſick ſhall bee able to bear, and make up the plaſter they do commonly add four ounces of quick-ſilver, yet for the moſt part they do increaſ the doſe, as they deſire the plaſter ſhould bee ſtronger: the worms muſt bee waſhed with fair water, and then with a little wine to cleanſ them from their earthie filth, of which they are full, and ſo the frogs are to bee waſh't and macerated in wine, and ſo boiled together to the conſumption of a third part; then the Squinanth muſt bee bruiſed, the Feverfew and the Stæchas cut ſmall, and they beeing added, to bee boiled to the conſumtion of one pint, and beeing boiled ſufficiently, the decoction beeing cooled ſhall bee ſtrained and kept; and the Litharge is to bee infuſed for twelv hours in the oil of Camomil, dill, Lilies, Saffron, and the axungia's above ſpoken of.

Then

Then boil them all with a gentle fire, by and by taking from it from the fire, and add one quart of the decoction above ſpoken of, then ſet it to the fire again that the decoction may bee conſumed, and then by degrees add to the reſt of the decoction: the oil of ſpike ſhall bee reſerved unto the laſt, which may give the plaſter a good ſmell. Then are added the juices of walwurt and enula, which muſt bee boiled until they bee waſted away. Afterwards it beeing taken from the fire, to the compoſition is added the frankincenſ and euphorbium, and white wax as much as ſhall ſuffice. When the whole maſs ſhall cool, then at laſt is mingled the quick-ſilver exſtinct, turpentine, oil of bitter almonds, baies, ſpike, of line, ſtyrax and axungia, beeing continually ſtirred, and it ſhall bee made up upon a ſtone into rolls. Unleſs the quick-ſilver bee well extinguiſhed, it will run all into one place, and unleſs you tarrie until the compoſition cool, it will vapor away in fume.

℞. *croci*, ʒii. *bdelli, maſtich. ammon ſtyrac. liquid. an* ʒ ß. *ceræ alb.* ℔ ß8. *tereb.* ʒ vi. *medul. cruris vaccæ, adipis anſerini, an* ʒi. *æſipi, vel ſi deſit, axung. gallin.* ʒix. *olei nard. quantum ſatis ad magdaleones formandos, expreſſionis ſcillæ*, ʒi ß. *olibani, ſevi vitul.* ʒ i. The *æſipus, ſepum, adeps, medulla, cera*, are to bee diſſolved together; when they cool, add the *ammoniacum* diſſolved in the decoction of fenugreek and camomil, half an ounce, and ſo much juice of ſquills, then put to the ſtyrax and turpentine, ſtirring them continually; then add the *bdellium, olibanum*, maſtich, aloes, brought into fine powder, and when they are perfectly incorporated into a maſs let them bee made up with *oleum nardinum* into rolls. *Ceratum aſepi ex Philagrio.*

℞. *terebinth.* ℔ ß. *reſin.* ℔i. *cer alb.* ʒ iv. *maſtich.* ʒi. *fol. verben. betonic. pimpinel. an.* mi. The herbs beeing green, the tops are to bee cut and bruiſed in a ſtone-mortar, and boiled in red wine to the conſumption of one third part. To the ſtrained liquor add wax cut into ſmall pieces, and beeing diſſolved by the fire; the liquor beeing conſumed put to the roſin, when it ſhall cool add the Maſtich powdred, working it with your hands, by which it may bee incorporated with the reſt of the things. *De gutta Dei.*

℞. *ſucci beton. plantag. apii, an.* ℔ i. *ceræ, picis, reſin. tereb. an.* ℔ ß. *fiat empl.* The juices are to bee mingled with the wax beeing diſſolved, and boiling them until three parts bee conſumed, add the roſin and pitch, which beeing diſſolved and hot, muſt bee ſtrained, and then add the turpentine, and make up the plaſter. *De ſanna ſeu de Betonicâ.*

℞. *croci, picis com.* (or rather *picis nivalis*, becauſ this emplaſter is uſed to diſcuſs and draw forth the matter which cauſſeth the pain in the joints) *coloph. ceræ, an.* ʒ ii. *tereb. galb. axungiæ ammon. thuris, myrrhæ, maſtich. an.* ʒ v ß. The *cera, pix*, and *colophonia* are by little and little to bee diſſolved, to which add the gums diſſolved according to art, and mingled with the terebinth; and taking it from the fire add the *thus, myrrha*, and at laſt the *crocus* in fine powder, and then make it up into rowls with oil of worms, *Emplaſtrum axungiæ croceum.*

℞. *ol. com.* ℔ ii. *ceruſ. ſubtiliſ.* ℔ i. boil them together with a gentle fire, ſtirring them up continually until they com to the bodie of an emplaſter: if you would have the plaſter whiter, take but ʒ ix. of the oil. *De ceruſâ.*

℞. *lytharg. triti, acet. fortiſ. an.* ℔ ß. *ol. antiq.* ℔ i. *fiat emplaſtrum*: let the oil bee mingled with the litharge for the ſpace of twelv hours; then boil them to a good conſiſtence, putting in the vineger by little and little; but you ſhall not take it from the fire until the vineger bee quite waſted away. *Triphermacum, ſeu nigrum.*

℞. *ol. vet.* ℔ iii. *axung. vet. ſine ſale*, ℔ ii. *litharg. trit.* ℔ iii. *vitriol.* ʒ iv. let the oil bee mingled with the litharge for the ſpace of twelv hours; and boil them to a good conſiſtence, then add to the axungia, ſtirring them continually with a ſpatter made of the palm-tree, reed, or willow, and beeing ſufficiently boiled, take it from the fire, and add the vitriol in fine powder. *Diapalma, ſeu diachalcitees.*

℞. *picis naval. aloes, an.* ʒ iii. *litharg. ceræ, coloph. galban. ammoniac. an.* ʒ ii. *viſci querni*, ʒ vi. *gypſi uſt. utriuſque ariſtolech. ana*, ʒ iv. *myrrhæ, thuris, an* ʒ vi. *tereb.* ʒ ii. *pulveris vermium terreſtrium, gallar. utriuſq. conſolid. bol. arm. an.* ʒ iv. *ſang humani*, ℔ i. *fiat emplaſt.* If you would have it of a verie good conſiſtence, you may add of the oil of myrtils or maſtich, ℔ ß. you ſhall make it thus: Take the skin of a Ram cut in pieces, and boil it in an hundred pintes of water and vineger until it com to a glue of ſtiff gellie, in which you ſhall diſſolv the *viſc. quer.* then add the pitch and wax broken into ſmall pieces, and if you will you may add the oil with them, afterwards the *galban.* and *ammoniac.* diſſolved in vineger, beeing mingled with the terebinth, may bee added. Then add the litharge, *gypſum, bol. ariſtolech. conſolida, vermes & ſang. humanum.* At laſt the myrrh, *thus, colophon* and *aloe*, ſtirring them continually; and that they may bee the better mingled, work the plaſter with a hot peſtil in a mortar. *Contra ruptu-ram.*

℞. *mucag. ſem. lini, rad. althæ. fœnug. medican. corticis ulmi, an.* ʒiv. *olei liliacei, chamæ. aneth. an*, ʒiß. *ammon. opopanac. ſagap. ana* ʒß. *croci*, ʒii. *ceræ nov.* ℔ ß. *tereb.* ʒß. *fiat empl.* Fernelius hath ʒxx. of wax: the wax beeing cut ſmall muſt bee mingled with the oils and the mucilages, ſtirring them continually with a wooden ſpatter till the liquor bee conſumed. Then the gums diſſolved and mingled with the terebinthina, muſt bee added, and laſt of all the ſaffron finely powdered. *De mucaginibus*

℞. *ol. roſ. myrtil. ung. populeon, ana*, ʒ iv. *pinguedinis gallin.* ʒii. *ſebi arietis caſtrati, ſepi vaccini, an.* ʒvi. *pingued. porci*, ʒx. *litharg. auri, argenti, an.* ʒ iii. *ceruſ.* ʒ iv. *minii*, ʒ iii. *tereb.* ʒ iv. *ceræ, q. ſ. fiat emplaſtrum vel ceratum molle.* The *lithargyros, ceruſa*, and *minium* are to bee brought into fine powder, ſeverally beeing ſprinkled with a little roſe water, leſt the fineſt of it ſhould flie away; *De minio.*

theſe

theſe beeing mingled with the oil of roſes and myrtles, with a gentle fire may bee boiled until they com to the conſiſtence of honie; then add the axungia's, and boil them till the whole grow black, after add the *ſebum*, and that beeing diſſolved take it from the fire, and then add the *unguentum populeon*, and ſom wax if there bee need, and ſo bring it to the form of a plaſter.

Diachylon magnum. R. *litharg. puri pul.* ℥xii. *ol. irin. chamem. aneth. an* ℥viii. *muc. ag. ſem. lini, fænug. rad. alth. ficuum ping. uvar. paſſar. ſucci ireos, ſcillæ, œſipi, ichthyocollæ, an.* ℥ vii ß. *tereb.* ℥ iii. *reſ. pini, ceræ flavæ, an.* ℥ ii. *fiat emplaſtrum.* The litharge is to bee mingled with the oil before it bee ſet to the fire, then by a gentle fire it is to bee boiled to a juſt conſiſtence; after the mucilage by degrees muſt bee put in, which beeing conſumed the juices muſt bee added and the ichthyocolla, and they beeing waſted too, then put to the wax, roſin, then taking the whole from the fire, add the œſipus and terebinthina.

The uſe of plaſters. Wee uſe plaſters when wee would have the remedie ſtick longer and firmer to the part, and would not have the ſtrength of the medicament to flie away or exhale too ſuddenly.

CHAP. XXVIII.

Of Cataplaſms and Pultiſſes.

The matter of cataplaſms. CAtaplaſms are not much unlike to emplaſters leſs properly ſo called, for they may bee ſpread upon linnen cloths and ſtoups like them, and ſo applied to the grieved parts. They are compoſed of roots, leavs, fruits, flowers, ſeeds, herbs, juices, oils, fats, marrows, meals, roſins. Of theſe ſom muſt bee boiled, others crude. The boiled are made of herbs boiled tender, and ſo drawn forth an hair-ſearſ, adding oils and axungia's thereto. The crude are made of herbs beaten, or their juices mixed with oil and flower, or other powders appropiate to the part or diſeaſ, as the Phyſician ſhall think fit. The quantitie of medicines entring theſe compoſitions can ſcarce bee defined, for that they muſt bee varied as wee would have the compoſition of a ſofter or harder bodie. Verily they ought to bee more groſs and denſ when as wee deſire to ripen anie thing, but more ſoft and liquid when wee endevour to diſcuſs. Wee uſe cataplaſms to aſſwage pain, digeſt, diſcuſs and reſolv unnatural tumors and flatulencies. They ought to bee moderately hot and of ſubtil parts, ſo to attract and draw forth; yet their uſe is ſuſpected the bodie beeing not yet purged, for thus they draw down more matter into the affected part. Neither muſt wee uſe theſe when as the matter that is to bee diſcuſſed is more groſs and earthie, for thus the ſubtler parts will bee onely diſcuſſed, and the groſs remain impact in the part unleſs your cataplaſm bee made of an equal mixture of things, not only diſcuſſing, but alſo emollient, as it is largely handled by *Galen*.

Their uſe.

Lib. 1. ad Glauc. uſi de ſcirrho.

This ſhall bee largely illuſtrated by examples. As, R. *medul. panis*, lb ß. *decoquantur in lacte pingui, adde olei chamem.* ℥ ſ. *axung. galin* ℥i. *fiat cataplaſma.* Or, R. *rad. alth.* ℥ iii. *fol. malv. ſenecionis, an.* m i. *ſem. lini, fænug. an.* ℥ ii. *ficus, ping.* nu. vi. *decoquantur in aquâ, & per ſetaceum tranſmittantur, addendo olei lilior.* ℥ i. *far. hord.* ℥ ii *axung. porcin.* ℥ i ſ. *fiat cataplaſma.* Or, R. *far. fab. & orob. an.* ℥ ii. *pulv. chamem. & melil. an.* ℥ iii. *ol. irin. & amygd. amar. an.* ℥i. *ſucci rut.* ℥ ß. *fiat cataplaſma.*

An anodyne cataplaſm.

A ripening cataplaſm.

A diſcuſſing cataplaſm.

How Pultiſſes differ from cataplaſms.

Pultiſſes differ not from cataplaſms, but that they uſually conſiſt of meals boiled in oil, water, honie, or axungia. Pultiſſes for the ripening of tumors are made of the flour of barlie, wheat, and milk, eſpecially in the affects of the entrals; or elſ to drie and binde, of the meal of rice, lentils, or *Orobus* with vineger; or to cleanſ, and they are made of honie, the flour of beans and lupines, adding thereto ſom old oil, or anie other oil of hot qualitie, and ſo make a diſcuſſing pultis. Alſo anodyne pultiſſes may bee made with milk; as thus for example, R. *farin. triticeæ*, ℥ii *micæ panis puriſſimi*, ℥ iii. *decoquantur in lacte, & fiat pulticula.* R. *farin. hordei & fab. an.* ℥ ii. *far. orob.* ℥ iii. *decoquantur in hydromelete, addendo mellis* quart. i. *olei amyg. amar.* ℥ ii. *fiat pulticula.* Wee uſe pultiſſes for the ſame purpoſe as wee do cataplaſms, to the affects both of the internal and external parts. Wee ſomtimes uſe them for the killing of worms, and ſuch as are made of the meal of Lupines boiled in vineger, with an ox's gall, or in a decoction of wormwood, and other ſuch like bitter things.

A ripening cataplaſm.

CHAP. XXIX.

Of Fomentations.

A *Fotus* or fomentation is an evaporation or hot lotion, chiefly uſed to mollifie, relax and aſſwage pain, conſiſting of medicines having theſe faculties. A fomentation commonly uſeth to bee moiſt, beeing uſually made of the ſame things as embrocations, to wit, of roots, ſeeds, flowers, boiled in water or wine. The roots here uſed are commonly of mallows, marſh-mallows, and lilies. The ſeeds are of mallows, marſh-mallows, parſlie, ſmallage, line, fenugreek. Flowers are of camomil, melilot, figs, raiſins, and the like: all which are to bee boiled in wine, water, or lee, the conſumption of the third part or the half: as,

R. *Rad. alth. & lil. an.* ℥ii. *ſem. lini, fænug. cumin. an.* ℥iii. *flo. cham. melil. & aneth. an.* p. i. *ſummit. orig.* m. ß. *bulliant in æquis partibus, aquæ & vini, aut in duabus partibus aquæ, & unâ vini, aut in*

Lixivio

Lixivio cineris ſarmentorum, ad tertiæ partis conſumptionem, fiat fotus. In imitation hereof you may eaſily deſcribe other fomentations, as occaſion and neceſſitie ſhall require.

Wee uſe fomentations before wee applie cataplaſms, ointments or plaſters to the part, that ſo wee may open the breathing places or pores of the skin, relax the parts, attenuate the humor, that thus the waie may bee the more open to the following medicines. The bodie beeing firſt purged, fomentations may bee uſed to what parts you pleaſ. They may bee applied with a female-ſpunge, for it is gentler and ſofter then the male; with felt, woollen cloaths, or the like dipped in the warm decoction wrung out, and often renued; otherwiſe, you may fill a Swine's bladder half full (eſpecially in pains of the ſides) of the decoction, or elſ a ſtone-bottle, ſo to keep hot the longer; yet ſo, that the bottle bee wrapped in cotton, wool, or the like ſoft thing, that ſo it may not by the hardneſs and roughneſs offend the part, according to *Hippocrates*. Their uſe. 2. *De victu in acutis.*

CHAP. XXX.

Of Embrocations.

AN *Embroche*, or Embrocation is a watering, when as from on high wee (as it were) ſhowr down ſom moiſture upon anie part. This kinde of remedie is chiefly uſed in the parts of the head, and it is uſed to the coronal ſuture, for that the skull is more thin in that part, ſo that by the *ſpiracula* or breathing places of this ſuture, more open then thoſe of the other ſutures, the force of the medicine may more eaſily penetrate unto the *Meninges*, or membranes of the brain. The matter of Embrocations is roots, leavs, flowers, ſeeds, fruits, and other things, according to the intention and will of the Phyſician. They are boiled in water and wine, to the half or third part. Embrocations may alſo bee made of Lie or Brine againſt the cold and humid affects of the brain. Somtimes of oil and vineger, otherwhiles of oil onely. R. *fol plantag. & ſolan. an* m.i. *ſem portul & cucurb. an* ʒii. *myrtil.* ʒi. *flor. nymph. & roſ. an* p.ß. *fiat decoct. ad* lbi. *cum aceti* ʒii. *ſi altè jubendum ſit, ex quâ irrigetur pars inflammata.* What an Embrocation is.

In affects of the brain, when wee would repercuſs, wee often and with good ſucceſs uſe oil of Roſes with a fourth part of vineger.

Wee uſe Embrocations, that together with the air drawn into the bodie by the *Diaſtole* of the arteries, the ſubtler part of the humor may penetrate, and ſo cool the inflamed part: for the chief uſe of embrocations is in hot affects. Alſo wee uſe embrocations, when as for fear of an hæmorrhagie, or the flying aſunder of a broken or diſlocated member, wee dare not looſ the bandages wherewith the member is bound. For then wee drop down ſom decoction or oil from high upon the bandages, that by theſe the force of the medicine may enter into the affected member. Their uſe.

CHAP. XXXI.

Of Epithemes.

Epithema, or an Epitheme, is a compoſition uſed in the diſeaſes of the parts of the lower and middle bellie, like to a fomentation, and not much unlike an embrocation. They are made of waters, juices, and powders, by means whereof they are uſed to the heart, cheſt, liver and other parts. Wine is added to them for the more or leſs penetration, as the condition of the hot or cold affect ſhall ſeem to require; for if you deſire to heat, more wine muſt bee added, as in ſwooning by the clotting of blood, by the corruption of the ſeed, by drinking ſom cold poiſon: the contrarie is to bee don in a fainting by diſſipation of the ſpirits by feverish heats, alſo vineger may bee added. The matter of medicines proper to the entrails is formerly deſcribed, yet wee commonly uſe the *ſpecies* of electuaries, as the *ſpecies elect. triaſantali* the liver beeing affected, and Diamargariton in affects of the heart. The proportion of the juices or liquors to the powders, uſe's to bee this, to everie pinte of them ʒi. or ʒiiß. of theſe, of wine or elſ of vineger ʒi. You may gather this by the following example. What an Epitheme is. In the ſixth Chapter.

R. *aqu. roſ. bugl. borag. an.* ʒiii. *ſuccí ſcabioſ.* ʒii. *pul. elect. diamarg. frigid* ʒii. *cort. citri ſicci* ʒi. *coral. raſ. chor. an.* ʒß. *ſem. citri & card. ben. an.* ʒiiß. *croci & moſchi an gra.* 5. *addendo vini albi* ʒii. *fiat Epithema pro corde.* A cordial Epitheme.

Epithemes are profitably applied in hectick and burning fevers to the liver, heart, and cheſt, if ſo bee that they bee rather applied to the region of the lungs; then of the heart; for the heat of the lungs beeing by this means tempered, the drawn in air becom's leſs hot in peſtilent and drying fevers. They are prepared of humecting, refrigerateing, and cordiall things, ſo to temper the heat, and recreate the vital facultie. Somtimes alſo wee uſe Epithemes to ſtrengthen the heart, and drive there-hence venenate exhalations, lifted or raiſed up from anie part which is gangrenate or ſphacelate. Som cotton, or the like, ſteeped or moiſtened with ſuch liquors and powders warmed, is now and then to bee applied to the affected entrail; this kinde of remedie, as alſo all other topick and particular medicines, ought not to bee uſed, unleſs you have firſt premiſed general things. Their uſe.

CHAP.

CHAP. XXXII.

Of Potential Cauteries.

The uſe of potential cauteries.

THat kinde of Pyrotick, which is termed a Potential Cauterie, burn's, and cauſſeth an eſchar. The uſe of theſe kindes of Cauteries is to make evacuation, derivation, revulſion, or attraction of the humors by thoſe parts whereto they are applied. Wherefore they are often and with good ſucceſs uſed in the punctures and bites of venemous beaſts, in a venemous, as alſo in a peſtilent *Bubo* and Carbuncle, unleſs the inflammation bee great: for the fire doth not onely open the part, but alſo retund's the force of the poiſon, call's forth, and plentifully evacuate's the conjunct matter. Alſo they are good in phlegmatick and contumacious tumors; for by their heat they take away the force and endevours of our weak heat. Alſo they are profitably applied to ſtanch bleeding, to eat or waſte the ſuperfluous fleſh of ulcers and wens, to bring down the callous lips of ulcers, and other things too long here to inſiſt upon.

The matter of them.

The materials of theſe Cauteries are Oke-aſhes, Pot-aſhes, the aſhes of Tartar, of Tithymals or ſpurges, the Fig-tree, the ſtalks of Colewurts and beans, cuttings of Vines, as alſo *ſal ammoniacum, alkali, axungia vitri, ſal nitrum*, Roman Vitriol, and the like; for of theſe things there is made a ſalt, which by it's heat is cauſtick and eſcharotick, like to an hot iron and burning coal: Therefore it violently looſe's the continuitie by eating into the skin, together with the fleſh there-under. I have thought good here to give you divers forms of them.

The forms of them.

Take of unquench't Lime exſtinguiſhed in a bowl of Barber's Lee three pounds: When the Lee is ſettled, let it bee ſtrained, and into the ſtraining put of *Axungia vitri*, or Sandiver, calcined Argol, of each two pounds, of *Sal nitrum & ammoniacum*, of each four ounces, theſe things muſt bee beaten into a groſs powder, then muſt they bee boiled over the fire, and after the boiling let them remain in the Lee for four and twentie hours ſpace, beeing often ſtirred about, and then ſtrained through a thick and double linnen-cloth, leſt anie of the earthlie droſs get thorow together with the liquor. This ſtrained liquor, which is as clear as water, they call *Capitellum*, and they put it in a braſen Baſin, ſuch as Barbers uſe, and ſo ſet it upon the fire, and aſſoon as it boil's, they keep it with continual ſtirring, leſt the ſalt ſhould adhere to the baſin; the *Capitellum* beeing half boiled away, they put in two ounces of powdred vitriol, ſo to haſten the falling of the eſchar, and ſo they keep the baſin over the fire until all the liquor bee almoſt waſted away. Then they cut into pieces the ſalt or that earthie matter, which remain's after the boiling away of the *Capellum*, and with a knife or hot iron ſpatula, form them into cauteries of ſuch figure and magnitude as they think fitting, and ſo they laie them up, or keep them for uſe in a viol or glaſs cloſely ſtopped, that the air get not in: Or,

Take a bundle or ſufficient quantitie of Bean-ſtalks or husks, of Colewurt-ſtalks two little bundles, of cuttings of Vines four handfuls, burn them all to aſhes, which put into a veſſel of river-water, ſo let them infuſe for a daie's ſpace, beeing ſtirred ever now and then; to this adde two pounds of unquench't Lime, of *Axungia vitri* half a pound, of calcined Tartar two pounds, of *Sal niter* four ounces, infuſe all theſe, beeing made into powder, in the foreſaid Lee for two or three daies ſpace, often ſtirring it, then ſtrain the *Capitellum* or liquor through a thick cloth until it becom clear. Put it into a baſon, and ſet it over the fire, and when as the moiſture is almoſt wholly ſpent, let two or three ounces of vitriol bee added, when the moiſture is ſufficiently evaporated, make cauteries of that which remain's, after the formerly mentioned manner.

Take of the aſhes of ſound, knottie, old Oke as much as you pleaſe, make thereof a Lee; powr this Lee again upon other freſh aſhes of the ſame wood, let this bee don three or four times, then quench ſom Lime in this Lee, and of theſe two make a *Capitellum*, whereof you may make moſt approoved cauteries. For ſuch aſhes are hot in the fourth degree; and in like ſort the ſtones, whereof the lime by burning becom's fierie and hot to the fourth degree: Verily, I have made cauteries of Oke-aſhes onely, which have wrought quickly and powerfully. The *Capitellum* or Lee is thought ſufficiently ſtrong, if that an egg will ſwim therein without ſinking. Or,

The ſign of good *Capitellum*.

Take of the aſhes of bean-ſtalks three pounds, of unquench't lime, Argol, of the aſhes of Oke-wood, beeing all well burnt, of each two pounds. Let them for two daies ſpace bee infuſed into a veſſel full of Lee made of the aſhes of Oke-wood, and bee often ſtirred up and down. Let this Lee then bee put into another veſſel, having manie holes in the bottom thereof, covered with ſtrums or ſtraw-pipes, that the *Capitellum* flowing through theſe ſtrait paſſages may becom more clear. Let it bee put twice or thrice upon the aſhes, that ſo it may the better extract the heat and cauſtick qualitie of the aſhes. Then putting it into a Barber's baſin, ſet it over the fire, and when it ſhall begin to grow thick, the fire muſt bee increaſed, and cauteries made of this concreting matter.

The faculrie of the ſilken caurerie.

The following cauteries are the beſt that ever I made trial of, as thoſe that applied to the arm in the bigneſs of a Peaſ, in the ſpace of half an hour without pain, eſpecially if the part of it ſelf bee painleſs and free from inflammation, eat into the skin and fleſh even to the bone,

bone, and make an ulcer of the bigness of ones finger's end, and they leav an eschar so moist and humid, that within four or five daies space it will fall away of it self without anie scarification. I have thought good to call these cauteries Silken or Velvet ones, not onely for that they are like Silk, gentle and without pain, but chiefly becaus I obteined the description of them of a certain Chymist, who kept it as a great secret, for som Velvet and much entreatie: Their description is this, The cauſ of the name.

Take of the ashes of Bean-stalks, of the ashes of Oke-wood well burnt, of each three pounds, let them bee infused in a prettie quantitie of river-water, and bee often stirred up and down, then add thereto of unquencht lime four pounds, which beeing quencht, stir it now and then together for two daie's space, that the *Capitellum* may becom the stronger, then strain it through a thick and strong linnen-cloth, and thus strained, put it three or four times upon the ashes, that so it may draw more of the caustick faculties from them, then boil it in a Barber's basin, or elſ an earthen one well leaded, upon a good Char-coal-fire, until it becom thick. But a great part of the secret or art consist's in the manner and limit of this boiling; for this *Capitellum* becomming thick and concreating into salt, must not bee kept so long upon the fire, until all the moisture shall bee vanished and spent by the heat thereof: for thus also the force of the foresaid medicines, which also consist's in a spirituous substance, will bee much dissipated and weakned; therefore before it bee com to extreme drines, it shall bee taken off from the fire, to wit, when as yet there shall som thick moisture remain, which may not hinder the cauteries from beeing made up into a form. The made-up cauteries shall bee put up into a glass most closely luted up or stopped, that the air may not dissolv them, and so they shall bee laid up and kept in a drie place. Now, becaus the powder of Mercurie is neer to cauteries in the effects and facultie thereof, which therefore is termed *Pulvis Angelicus* for the excellencie; therefore I have thought good to give you the description thereof, which is thus: Their description.

℞. *Auripigmenti citrini, floris æris, an.* ℥ii. *salis nitri,* ℔iß. *alumin. rochæ,* ℔ii. *vitrioli rom.* ℔iii. Let them all bee powdred, and put into a Retort, having a large receiver well luted put thereto. Then set the Retort over a Fornace, and let the distillation bee made first with a gentle fire, then increased by little and little, so that the receiver may wax a little reddish. The description of Mercurie or Angelical powder.

℞. *Argenti vivi,* ℔ß. *aquæ fortis,* ℔i. *ponantur in phiala, & fiat pulvis, ut sequitur.*

Take a large earthen pot, whereinto put the viol or bolt-head wherein the *Argentum vivum* and *Aqua fortis* are conteined, setting it in ashes up to the neck thereof, then set the pot over a fornace, or upon hot coals, so that it may boil and evaporate away the *Aqua fortis*: neither in the *interim* will the glass bee in anie danger of breaking, when all the water is vanished away, which you may know is don when as it leav's smoaking; suffer it to becom cold, then take it forth of the ashes, and you shall finde calcined Mercurie in the bottom, of the color of red Lead, separated from the white, yellow or black excrement; for the white that concrete's in the top is called Sublimate, which if it should remain with the calcined Mercurie, you shall make it into powder, and put it in a brass-vessel upon som coals, stirring or turning it with a *spatula* for the space of an hour or two: for thus it will lose a great part of the acrimonie and biting, whence it will becom less painful in the operation.

CHAP. XXXIII.

Of Vesicatories.

VEsicatorie and rubrifying ointments, cataplasms, or plasters are made of acrid medicines, which have power to draw forth to the superficies of the bodie such humors as lie deep, by exulcerating the skin and causing blisters. Their matter is the same with septick medicines; as, *Sinapi, anacardus, cantharides, euphorb. radices scyllæ, bryon.* and the like, which with honie, turpentine, leaven, gum, or rosin, may bee made into cataplasms, ointments, or plasters; therefore the composure of vesicatories, or rather their consistence differ's not from that of hard or soft unguents. Therefore I will give you one example or description of them, which is thus. What vesicatorie and rubrifying medicines are.

℞. *cantharid. euphorbii, sinapi, an.* ℥ß. *mellis anacardini,* ℥i. *modico aceti, & fermenti quod sit satis excipiantur, & fiat vesicatorium.* Som of the antients think it better to make up these medicines with water rather then with vineger, becaus experience teacheth that vineger abate's the strength of mustard. Wee use this kinde of medicine in long diseases, when as wee cannot anie thing prevail with other remedies; especially in the head-ach, megrim, epilepsie, *sciatica,* gout, the bites and punctures of venemous creatures, pestilent carbuncles, and other inveterate and contumacious diseases. The description of a vesicatorie. Their use.

Also wee use them when as wee would restore life and strength to a dead or decaied part, for thus they are drawn back together with the heat; for which purpose wee must make choise of more gentle vesicatories, as such which onely rubrifie, so that the part may onely becom red, and not bee burnt: the patt must first bee strongly rubbed, that the decaied and dull heat may bee rowzed and stirred up, the pores of the skin more opened, that the force of the medicine may enter the deeper into the bodie.

CHAP.

CHAP. XXXIV.

Of Collyria.

What a *collyrium* is.

A *Collyrium* is a medicine proper for the eies, made of powder finely levigated and groun'd into the form of *Alchobol*, as the Arabians and our Alchymists term it: yet the word in a more general acception is used for anie liquid medicine, made with liquors and powders, and applied or used to anie part. Wherefore *collyria*

The differences of them.

are of three kindes, som are moist or liquid, which are properly called *collyria*; others drie, which are of the same consistence with Trochisces; others have the consistence

Their use.

of honie, or a liniment. The liquid serv for the greater and lesser corners of the eies; those of the consistence of honie are meet for the apple of the eie; but the drie are to bee made into powder, and so blown into the eies: also somtimes they are to bee dissolved in som juice, or other convenient liquor, that so they may bee made into a moist *collyria*.

Therefore *collyria* have diverse uses, and are applied to several parts according to the intention and counsel of the Physician: for liquid *collyria* put into the corners of the eies do more readily mitigate the heat of their inflammation, by reason they enter more easily by the tenuitie of their substance, such things as have a more firm consistence adhere more tenaciously,

Their matter.

and work more certainly. Moist *collyria* are made of juices, mucilages, waters of herbs, flowers, seeds, metalline bodies, galls, and other such like medicines, which are repercussives, resolvers, detergents, anodynes, and the like, according to the nature of the present disease.

Somtimes they are made of juices and distilled waters onely, otherwhiles powders, or drie *collyria* made into powder, are mixed with them, together with the white of an egg. Powders are prescribed to ʒii. and liquors to ʒiv. or ʒv. in medicines for the eies; but for other parts, as when it is to bee injected into the urinarie passage, they may bee prescribed to the quantitie of a pinte. Drie *collyria* are made of powders exceeding finely beaten or groun'd, and incorporated with som juice, whence it is that they differ little from Trochisces. Wherefore the *collyrium album Rhasis* is now usually termed a Trochisce, and kept with them. Catheretick powders are not applied in the form of a moist *collyrium*, but in the form of a liniment, that is, incorporated with fat or oil. All these things shall bee made more plainly by the following examples.

A repercussive *collyrium*. An anodyne. A detergent.

℞. *aq. plant. & rosar. an.* ʒii. *album. ovi unum, bene agitatum, misce, fiat collyrium.* ℞. *aq. rosar. & viol. an.* ʒiii. *trochis. alb. Rhas. cum opio,* ʒii. *fiat collyrium.* Or, ℞. *decoct. fœnug.* ʒiii. *muc. ag. sem. lini,* ʒii. *saccar. cand.* ʒi. *croci,* ℈i. *fiat collyr.* ℞. *thuris, myrrh.* ℈ii. *tut. prepar. & antimon. lot. an.* ʒii. *cum succo chelidon. fiat collyrium in umbrâ siccand.* ℞. *fellis perdic. ant lepor.* ʒß. *succi fœnicul.* ʒi. *saccar. cand.* ʒii. *syrup. ros. excipiantur, fiat collyrium.*

Wee use *collyria* in wounds, ulcers, fistula's, suffusions, inflammations, and other diseases of the eies.

CHAP. XXXV.

Of Errhines and Sternutatories.

What an errhine is.

Their differences.

Errhines are medicines appointed to bee put into the nose to purge the brain of it's excrementitious humors by the nostrils, or to deterge such excrements as are therein, by reason of an *ozæna*, *polypus*, or the like disease. Errhines are either liquid or drie, or else hard, and of the consistence of an emplaster. Liquid errhines, which usually are to purge the head, are made of the juices of herbs; as beets, colewurts, marjoram, pimpernel, hyssop or balm, or of their decoctions taken alone, or mixed with wine, or syrup, as *oxymel scilliticum*, syrup of hyssop, roses, or *mel anthosatum*: somtimes powders are mixed with these liquors; as of pepper, *euphorbium*, pellitorie of Spain, hore-hound, *nigella romana*, *castoreum*, myrrh, white ellebore, sow-bread, and other like, in a small quantitie, to wit, to ʒi. little more or less according to the vehemencie of the disease. Wee will make this more plain by examples.

The form of one.

℞. *succi betæ, majoran, brassic. an.* ʒi. *depurentur, & modicè bulliant cum vini albi,* ʒii. *oxymelit. scillit.* ʒß. *fiat errhinum.* When as you desire to attract more powerfully from the brain, you may dissolv in errhines som purging medicines; as agarick, *diaphœnicon*, *senna*, *carthamus*, and the like: hence doth arise the distinction of errhines into such as are meet to purge phlegm, choler, and melancholie. This following example is set down by *Rondeletius*.

An errhine purging phlegm.

℞. *rad. pyreth. irid. an.* ʒi. *puleg. calam. origon. an.* m i. *agar. trochisc.* ʒiii. *flor. anthos & stœchad. an.* p i. *fiat decoctio in colatur.* Ibi. *dissolve mellis anthosati & scillit. an.* ʒiii. *fiat caput purgium.* But it is better to this purpose to make use of purging simples; as agarick, turbeth, coloquintida, and the like, then of compositions; as *diaphœnicon*, for these make the decoction more thick, and less fit to enter the passages of the nostrils, and the siev-like bones, but apt rather there to cause obstruction, and intercept the freedom of respiration.

An errhine with powders.

℞. *succi betæ,* ʒi. *aq. salv. & beton. an.* ʒiiß. *pul. castor.* ℈ß. *piper. & pyreth. an.* ℈i. *fiat caput purgium.* Drie errhines that are termed sternutatories, for that they cause sneesing, are made of powders onely, to which purpose the last mentioned things are used; as also aromatick

things

things in a ſmall quantitie, as to ʒii. at the moſt: as, ℞. *major. nigel, caryoph. zinzib, an.* ℈i. *dcor. pyreth. & panis porcin. an.* ʒß. *eupborb.* ℈i. *terantur, & in nares mittantur, aut inſufflentur.* Errhines of the conſiſtence of Emplaſters, by the Latins vulgarly called *Naſalia*, are made of the deſcribed powders or gums diſſolved in the juice of ſom of the forementioned herbs, incorporated with turpentine and wax, that ſo they may the better bee made into a pyramidal form to bee put into the noſtrils. As, ℞. *majoran. ſalv. nigel.* ℈ii. *pip. alb. caryoph. galang. an.* ℈i. *pyreth. eupborb. an.* ʒß. *panis porcin. ellebor. alb. an.* ℈i. *terantur, & in pulverem redigantur.* And then with turpentine and wax as much as ſhall bee ſufficient, make them up into *Naſalia* of a pyramidal or taper-faſhion. Wee uſe errhines in inveterate diſeaſes of the brain; as the epilepſie, fear of blindeneſs, an apoplexie, lethargie, convulſion, the loſt ſenſ of ſmelling: yet wee firſt uſe general remedies and evacuations, leſt by ſneeſing and the like concuſſion of the brain for the excluſion of that which is offenſive thereto, there ſhould bee made a greater attraction of impuritie from the ſubjacent parts. Liquid things muſt bee drawn up into the noſtrils warm out of the palm of the hand, to the quantitie of ʒß. the mouth beeing in the interim filled with water, leſt the attracted liquor ſhould fall upon the palat, and ſo upon the lungs: drie errhines are to bee blown into the noſe with a pipe or quill: ſolid ones muſt bee faſtned to a thred, that they may bee drawn forth as need require's, when as they are put up into the noſtrils. The morning (the bellie beeing emptie) is the fitteſt times for the uſe of errhines. If by their force the noſe ſhall bee troubled with an itching, the pain thereof muſt bee mitigated by woman's milk, or oil of violets. The uſe of attractive errhines is hurtful to ſuch as are troubled with diſeaſes of the eies, or ulcers in the noſe, as it oft-times fall's out in the *Lues venerea*: wherefore in this caſe it will bee beſt to uſe Apophlegmatiſms, which may divert the matter from the noſe.

A ſternutatorie.

The matter of ſolid errhines.

Their uſe.

The manner of uſing them.

To whom they are hurtful.

CHAP. XXXVI.

Of Apophlegmatiſms, or Maſticatories.

Apophlegmatiſmoi in Greek, and *Maſticatoria* in Latine, are medicines which kept or held in the mouth and ſomwhat chawed, do draw by the mouth forth of the brain excrementitious humors, eſpecially phlegm: now they are chiefly made four manner of waies; the firſt is when as the medicines are received in honie or wax, and formed into pills, and ſo given to chaw upon. The ſecond is, when as the ſame things are bound up in a fine linnen-cloth, ſo to bee held in the mouth. The third is when as a decoction of acrid medicines is kept in the mouth for a prettie ſpace. The fourth is when as ſom acrid medicine, or otherwiſe drawing phlegm, as pellitorie of Spain, maſtich, and the like, is taken of it ſelf to the quantitie of a haſel-nut, and ſo chawed in the mouth for ſom ſpace. The matter of maſticatories is of the kinde of acrid medicines; as of pepper, muſtard, hyſſop, ginger, pellitorie of Spain, and the like; amongſt which you muſt make choice chiefly of ſuch as are not troubleſom by anie ingrate taſte, that ſo they may bee the longer kept in the mouth with the leſs offence and loathing. Yet maſticatories are ſomtimes made of harſh or acerb medicines; as of berberies, the ſtones of prunes or cherries, which held for ſom ſpace in the mouth, draw no leſs ſtore of phlegm then acrid things; for the verie motion and rowling them up and down the mouth attract's, becauſ it heat's, compreſſe's, and expreſſe's: the quantitie of the medicine ought to bee from ʒß. to ʒiiß: as, ℞. *pyreth. ſtaphiſag. an.* ʒiiß. *maſtich.* ʒß. *pulverentur & involventur nodulis in maſticatoria.* Or, ℞. *zinzib. ſinap. an.* ʒi. *eupborb.* ℈ii. *piper.* ʒß. *excipiantur melle, et fiant paſtilli pro maſticatoriis.* ℞. *hyſſop. thym. origan. ſalv. an.* p i. boil them in water to waſh the mouth withall. Or, ℞. *zinzib. caryoph. an* ʒi. *pyreth. pip. an* ʒß. *ſtaphiſagr.* ʒii. *maſtiches*, ʒß. *excipiantur, fiant paſtilli pro maſticatoriis.* Wee uſe maſticatories in old diſeaſes of the brain, dimneſs of the ſight, deafneſs, puſtles of the head and face, and ſomtimes to divert the excrements which run to the noſe beeing ulcerated.

What an apophlegmatiſm is.

The differences.

The uſe of maſticatories.

Maſticatories are verie hurtful to ſuch as have their mouths or throats ulcerated, as alſo to them whoſe longs are ſubject to inflammations, diſtillations and ulcers; for then errhines are more profitable to derive the matter of the diſeaſ by the noſtrils. For though the humor drawn from the brain into the mouth by the means of the maſticatorie, may bee thence caſt forth by coughing and ſpitting, yet in the interim nature will bee ſo inured to that paſſage for the humor, ſo that it will run that waie when as wee ſleep, and fall down upon the parts thereunder, weak either by nature, or by accident.

To whom hurtful.

The time fitteſt for the uſe of Apophlegmatiſms is the morning, the bodie beeing firſt purged; if anie ingrateful taſte remain in the mouth, or adhere to the tongue by uſing of maſticatories, you ſhall take it away by waſhing the mouth with warm water, or a decoction of liquorice and barlie.

CHAP. XXXVII.

Of Gargariſms.

A Gargle or gargariſm is a liquid compoſition fit for to waſh the mouth and all the parts thereof, to hinder defluction and inflammation, to heal the ulcers which are in thoſe parts, to aſſwage pain. Their compoſition is two-fold, the firſt is of a decoction of roots, leavs, flowers,

What a gargle is.

The differences thereof.

flowers, fruits, and ſeeds fit for the diſeaſ; now the decoction is to bee made either in fair water alone, or with the admixture of white or red wine, or in the decoction of liquorice and barlie, or of pectoral things, as the intention of the Phyſician is to repel, cool, or hinder inflammation; as in the tooth-ach cauſſed by matter which is yet in motion; to diſcuſs, as in the tooth-ach already at the height; or to cleanſ, as in the ulcers of the mouth; or to drie and binde, as when it is fit to heal the ulcers already cleanſed.

Their matter. The other waie of making of gargariſms is without decoction, which is, when as wee make them either of diſtilled waters onely, or by mixing them with ſyrups, mucilages, milk, the whey of Goat's-milk carefully ſtrained. There are mixed ſomtimes, with a decoction, diſtilled waters and mucilages, *mel roſatum, oxymel ſimplex, diamoron, dianucum, hiera, picra, oxyſaccharo, ſyrup. de roſis ſiccis, ſyrupus acetoſus*, and other things, as the preſent caſe ſhall ſeem to require; as alum, *balauſtia*, myrrh, *olibanum*, ginger, pepper, cinnamom, drie roſes, and manie ſuch things; even ſo that oft-times there enter into gargles ſuch medicines as have force to draw from the brain; as pellitorie of Spain, carthamus, turbith, and ſuch things as have no bitterneſs, which is the cauſ that neither agarick nor coloquintida ought to enter into gargariſms.

The quantitie of liquor for a gargariſm is commonly from ℔ ß. to ℔i. mix therewith ſom ʒii. of ſyrups, but put in powders ſparingly; as ſom ʒiii. Alum may ſomtimes bee put in to ʒvi. let mucilages bee extracted out of ʒii. of ſeeds: let theſe ſerv for ſom examples.

An aſtringent gargle. An anodyne gargle. Rꝛ. *plant. polygon. exalidis, an.* m i. *roſar. rub.* p ß. *hordei,* p i. *fiat decottio ad* ʒviii. *in quâ diſſolve ſyrupi myrtillorum,* ʒvi. *dianucum,* ʒß. *fiat gargariſma*, Or, Rꝛ. *cham melil aneth. an.* p i. *roſ. rub.* p ß. *paſſul. mund. & ficuum, an.* p iii. *decoquantur in æquis partibus vini & aquæ, ad* ʒvi. *addendo mucag. ſem. lini, & fænugr. an.* ʒii. *fiat gargariſma.*

Or elſ, Rꝛ. *aq. plantag. liguſt. abſinth. an* ʒii. *mellis roſati colati,* ʒvi. *ſyrup. roſar. ſiccar. & de abſinth. an.* ʒvi. *fiat gargariſma.*

A deterſive. Wee uſe gargles in the morning faſting after general purgations; they are ſomtimes taken or uſed cold, when as malign, acrid, and thin humor fall's down, ſomtimes warm, but let theſe things bee don according as the Phyſician ſhall adviſe.

CHAP. XXXVIII.

Of Dentifrices.

What a dentifrice is. The differences. The matter whereof they conſiſt. DEntifrices are medicines prepared and ſerving divers waies for to cleanſ, whiten, and faſten the teeth; for from their uſe they take their name. Of theſe, ſom are drie, other ſom moiſt: of the drie, ſom have the form of opiats, others of powders groſly beaten, but the moiſt are commonly made by diſtillation: the matter of drie dentifrices is taken from detergent and drying things; ſuch as are coral white and red, hart's-horn, ſcuttle-bones, alum, cryſtal, pumice, ſal-nitre, myrrh, frankincenſ, *balauſtia*, acorns, all ſorts of ſhells of fiſhes: all theſe are to bee made into powder either by burning, or without it, for ſcuttle-bones burn't caſt forth a ſtinking and unpleaſant ſmell. To theſe for ſmell ſake are added certain aromatick things; as cinnamom, cloves, nutmegs, and the like: ſuch powders if mixed with ſom ſyrup; as *oxymel ſcilliticum*, or with mucilage of gum arabick and tragacanth, will becom opiats, to bee made into a pyramidal form of ſom finger's length, round or ſquare, and ſharp pointed, that dried they may ſerv for dentifrices.

Somtimes emollient roots are boiled with ſalt or alum, that dried again they may bee uſed for dentifrices: moiſt ones are made of drying herbs, diſtilled together with drying and aſtringent things.

A powder for a dentifrice. All the differences ſhall appear by the following examples. Rꝛ. *lapidis ſpong. pumicis, & cornu cervi uſt. an.* ʒii. *coral. rub. & cryſtal. an.* ʒi. *alum. & ſal. uſt. an.* ʒiß. *cinnamom. & caryoph. roſar. rub. pulver. an.* ℈ii. *fiat pulvis pro dentrificio.* Or, Rꝛ. *oſſis ſepiæ,* ʒß. *maſtiches, coralli rubri uſti, an.* ʒii. *cornu cervi uſti,* ʒiß. *aluminis, carbonis, roriſmarini, an.* ʒi. *cinnamomi,* ʒii. *fiat pulvis pro dentifricio.* Or, Rꝛ. *oſſis ſepiæ, alum. & ſalis uſti, an.* ui. *cryſtalli, glandium, myrrhæ, thuris, an.* ℈ii. *corticis granatorum, macis, cinnamomi, an.* ℈i. *fiat pulvis qui excipiatur mucagine gummi tragacanth. & formentur pyramides longæ, ſiccand. pro dentifricio.* Or, Rꝛ. *rad. malvæ junioris, & biſmalvæ, an.* ʒii. *coquantur in aquâ ſalsâ aut aluminoſa, deinde ſiccentur in furno pro dentifricio.* Rꝛ. *ſalis,* ʒvi. *alumin.* ʒiii. *thuris, maſtiches, ſanguis draconis, an.* ʒß. *aquæ roſ.* ʒvi. *diſtillentur in alembico vitreo pro dentrifricio.*

Their uſe. Dentrifices are not onely good to poliſh, cleanſ, and ſtrengthen the teeth; but wee alſo oft-times uſe them for the tooth-ach, the diſeaſes of the mouth, and ulcers of gums. You may uſe them in the morning, before and after meat.

The ancients, of lentisk-wood made themſelvs tooth-picks, and ſuch deviſes to ſtrengthen their looſ teeth, which alſo at this daie is in uſe with thoſe of *Languedock*, with whom this wood is plentiful, ſo that it may bee brought thence for the uſe of Noblemen and Gentlemen; myrrh may alſo ſerv for this ſame uſe, and anie other aſtringent wood.

Our people commonly uſe the ſtalks of fennel; yet have they no facultie to faſten the teeth, but their ſmell is grateful.

CHAP. XXXIX.

Of Bags or Quilts.

What a bag or quilt is. Their differences.

PHysicians term a bag or *sacculus*, the composition or mixture of drie and powdred medicines put in a bag, therefore it is as it were a drie fomentation. Their differences are not drawn from anie other thing then from the varietie of the parts whereto they are applied: such as are for the head must bee made into the fashion of a cap, those which bee for the whole ventricle must bee made into the form of a cithern; those for the spleen, like to an ox's tongue: lastly, such as are for the liver, heart, and other parts, must bee made according to the figure of those parts. Their matter is usually taken from whole seeds fried in a frying-pan, or made into powder, there are somtimes added roots, flowers, fruits, rindes, cordial-powders, and other drie medicines, which may bee easily brought into powder, and conduce to the grieved parts; the quantitie is different according to the magnitude of the affected parts: In the books of practisers it is commonly found prescribed from ℥iii. to ℥viß somtimes flowers, and drie herbs are prescribed by handfuls and pugils: and here there is need of an artificial conjecture to conceiv and appoint a fit quantitie of powders: but let us give you som examples.

A quilt for the stomach. R. *rosar. rub.* p i. *mastich.* ℥ß *coralli rub.* ʒiii. *sem. anisi, & fœnic. an.* ʒii. *nucis moschat.* ʒi. *summitat. absinth. & mentb. an.* m i. *tritis omnibus, fiat sacculus consutus & compunctus pro ventriculo.*

A cap for a cold head. R. *furfuris macri,* p i. *milii,* ℥i. *salis,* ʒii. *rosar. rub. flor. rorismarini, stœchados, caryoph. an.* m ii. *fol. beton. & salv. an.* ʒiii. *tritis omnibus fiat cucuphæ, intersuta & calefacta fumo thuris, & sandaracbæ exustorum, capiti apponatur.*

A quilt for the heart. R. *flor. borag. bugloss. & violar. an.* p ii. *cortic. citri sicci, macis, ligni aloës, rasuræ eboris, an.* ʒi. *ossis de corde cervi, croci, an.* ℈ii. *fol. melis.* mß. *pulveris diambræ.* ʒ ß. *contritis omnibus fiat sacculus è serico pro corde, irrorandus aquâ scabiosæ.*

Their use. Wee use bags for the strengthening of the noble parts; as the brain, heart, liver: as also for those less noble; as the stomach: lastly for discussing flatulencies in what part soever; as in the collick, and in a bastard pleurisie proceeding from flatulencies. The powders must bee strawed upon carded bombast, that they run not together, and then they must bee sewed up or quilted in a bag of linnen or taffatie.

Wee often-times moisten these bags in wine or distilled water, and somtimes not with the substance thereof, but by the vapor onely of such liquors put into a hot dish: thus oft-times the bags are heated by the vapor onely, and oft-times at the fire in a dish by often turning them. These, if intended for the heart, ought to bee of crimson or scarlet silk, becaus the scarlet-berrie, called by the Arabians *Kermes*, is said to refresh and recreate the heart. Certainly they must alwaies bee made of som fine thing, whether it bee linnen or silk.

CHAP. XL.

Of Fumigations.

What a fumigation is. Their differences and matter.

A *Suffitus* or fumigation is an evaporation of medicines having som viscous and fattie moisture: of fumigations som are drie, othersom moist, the drie have the form of trochises or pills: their matter ought to bee fattie and viscous, so that it may send forth a smoke by beeing burnt: such are *ladanum*, myrrh, mastich, pitch, wax, rosin, turpentine, *castoreum*, *styrax*, frankincens, *olibanum*, and other gums, which may bee mixed with convenient powders: for they yeeld them a bodie and firm consistence; the fumigations that are made of powders onely, yeeld neither so strong nor long a fume.

A cephalick fume. The quantitie of the powders must bee from ℥ß. to ℥iß. but the gums to ℥ii. as, R. *sandaracbæ, mastiches, rosar. an.* ʒi. *benioini, galang. an.* ʒiii. *terebinthina excipiantur, & fiant trochisci, quibus incensis suffumigentur tegumenta capitis.* R. *marchasitæ,* ℥ii. *bdellii, myrrhæ, styracis, an.* ℥iß. *ceræ flavæ, & terebinth. quod sufficit, fiant formulæ pro suffumigio.* For the hardnes of the sinews. R. *cinnabaris,* ℥ii *styracis & benzoini, an.* ℥ii. *cum terebinth. fiant trochisci pro suffumigio per embotum.*

For the relicks of the *Lues venerea*. Wee use fumigations in great obstructions of the brain, ulcers of the longs, the *asthma*, an old cough, pains of the sides, womb, and the diseases of som other parts; somtimes the whole bodie is fumigated, as in the cure of the *Lues venerea* to procure sweat: somtimes onely som one part whereto som relicks of the *Lues* adhere's; such fumigations are made of *cinnabaris*, wherein there is much *hydrargyrum*. The fume must bee received by a funnel, that so it may not bee dispersed, but may all bee carried unto the part affected, as is usually don in the affects of the womb and ears. The manner of using them.

In fumigations for the brain and chest, the vapor would bee received with open mouth; which thence may pass by the weason into the chest, by the palat and nostrils into the brain: but in the interim let the head bee vailed, that none of the vapor may flie away. Moist fumigations are made somwhiles of the decoction of herbs, otherwhiles of som one simple medicine boiled in oil, somtimes a hot fire-stone is quench't in vineger, wine, *aqua vitæ*, or the like liquor, so to raise a humid vapor. Wee oft-times use this kinde of fumigation in overcomming scirrous affects, when as wee would cut, discuss, penetrate deep, and drie: take this as an example thereof.

The manner of a moiſt fumigation.

℞. *Laterem unum ſatis craſſum, aut marchaſitam ponderis* ℔i. heat it red hot, and then let it bee quencht in ſharp vineger, powring thereon in the mean while a little *aqua vitæ*, make a fumigation for the grieved part.

Fumes of the decoction of herbs do verie little differ from fomentations properly ſo called; for they differ not in the manner of their compoſure, but onely in the application to the affected parts: therefore let this bee an example of a humid fumigation.

A moiſt fume for the ears.

℞. *abſinth. ſalv. rut. origan. an.* p i. *rad. bryon. & aſar. an.* ℥ß. *ſem. ſinap. & cumin. an.* ʒii. *decoquantur in duabus partibus aquæ, & unâ vini pro ſuffitu auris cum embotio*: and oft-times ſuch fumigations are made for the whole bodie, whereof wee ſhall treat hereafter.

CHAP. XLI.

Of a particular, or half-bath.

What an *inſeſſus* is.

Semicupium or half-bath, is a bath for the one half of the bodie; that is, for the parts from the bellie downwards: it is called alſo an *inſeſſio*, becauſ the patient ſitteth to bathe in the decoction of herbs: in which form and reſpect a *ſemicupium* differ's from a fomentation; for it is compoſed of the ſame matter, to wit, a decoction of herbs, roots, ſeeds, fruits, but in this the quantitie of the decoction is the greater, as wee ſhall teach by the following example.

The matter.

A half-bath for the ſtone in the kidnies.

℞. *malv. biſmalv. cum toto, an.* m i ß. *beton. ſaxifrag. pariet. an.* m i. *ſem. melon. milii ſolis, alkekengi, an.* ʒiii. *cicer. rub.* p. ii. *rad. apii, graminis, fœniculi, eryngii, an.* ʒ i. *decoquantur in ſufficiente aquæ pro inſeſſu.*

The uſe.

Wee uſe theſe half-baths in affects of the kidnies, bladder, womb, fundament, and lower bellie, or otherwiſe when as the patient by reaſon of weakneſs and fear of diſſipating the ſpirits, cannot ſuffer or away with a whole bath. The manner of uſing it is thus: Fill ſom bags with the boiled herbs, or other parts of plants, and cauſ the patient to ſit upon them; yet in the interim keep the vapors from the head, leſt they ſhould offend it, by caſting over it a linnen cloth, or elſ let him not enter thercinto until the vapor bee exhaled.

The manner of uſing it.

CHAP. XLII.

Of Baths.

Baths are nothing elſ then as it were a fomentation of the whole bodie, both for preſerving health, and the cure of diſeaſes: this is a verie commodious form of medicine, and among other external medicines much celebrated by the Greek, Arabian, and Latine Phyſicians. For a bath, beſides that it digeſt's the acrid humors, and ſootie excrements lying under the skin, mitigate's pains and wearineſs, and correct's all exceſs of diſtemper: moreover, in the cure of fevers, and manie other contumacious and inveterate diſeaſes it is the chief and laſt remedie, and as it were the refuge of health, ſtored with pleaſing delight. Baths are of two ſorts, ſom natural, others artificial: natural, are thoſe which of their own accord, without the operation or help of art, prevail or excel in anie medicinal qualitie. For the water which of it ſelf is devoid of all qualitie that is perceivable by the taſte, if it chance to bee ſtrained through the veins of metals, it furniſhe's and impregnate's it ſelf with their qualities and effects: hence it is that all ſuch water excel's in a drying facultie, ſomtimes with cooling and aſtriction, and otherwhiles with heat and a diſcuſſing qualitie. The baths whoſe waters beeing hot or warm, do boil up, take their heat from the cavities of the earth and mines filled with fire; which thing is of much admiration whence this fire ſhould ariſe in ſubterrene places, what may kindle it, what feed or nouriſh it for ſo manie years, and keep it from beeing extinct. Som Philoſophers would have it kindled by the beams of the ſun, others by the force of lightning penetrating the bowels of the earth, others by the violence of the air vehemently or violently agitated, no otherwiſe then fire is ſtruck by the colliſion of a flint and ſteel. Yet it is better to refer the cauſ of ſo great an effect unto God the maker of the Univerſ, whoſe providence piercing everie waie into all parts of the World, enter's and govern's the ſecret parts and paſſages thereof. Notwithſtanding they have ſeemed to have com neareſt the truth, who refer the cauſ of heat in waters unto the ſtore of brimſtone conteined in certain places of the earth, becauſ among all minerals it hath moſt fire and matter fitteſt for the nouriſhing thereof. Therefore to it they attribute the flames of fire which the Sicilian mountain *Ætna* continually ſend's forth. Hence alſo it is that the moſt part of ſuch waters ſmell of Sulphur, yet others ſmell of Alum, others of Nitre, others of Tar, and ſom of Coperas.

The faculties of Baths.

Their differences.

Natural Baths

How to know whence the Baths have their efficacie.

Now you may know from the admixture of what metalline bodies the waters acquire their faculties by their taſte, ſent, color, mud, which adhere's to the channels through which the water run's, as alſo by an artificial ſeparation of the more terreſtrial parts from the more ſubtil. For the earthie droſs which ſubſides or remain's by the boiling of ſuch waters, will retein the faculties and ſubſtance of brimſtone, alum, and the like minerals: beſides alſo, by the effects and the cure of theſe or theſe diſeaſes, you may alſo gather of what nature they are. Wherefore wee will deſcribe each of theſe kindes of waters by their effects, beginning firſt with the Sulphureous.

Sulphureous waters powerfully heat, drie, reſolv, open, and draw from the center unto the ſurface

surface of the bodie; they cleans the skin troubled with scabs and tetters; they ceas the itching of ulcers, and digest and exhaust the causses of the gout, they help pains of the colick and hardened spleens. But they are not to bee drunk, not onely by reason of their ungrateful smell and taste, but also by reason of the malitiousnes of their substance, offensive to the inner parts of the bodie, but chiefly to the liver. The condition of natural sulphureous waters.

Aluminous waters taste verie astrictively, therefore they drie powerfully, they have no such manifest heat, yet drunk, they loos the bellie: I beleev by reason of their heat and nitrous qualitie they cleans and staie defluxions, and the courses flowing too immoderately; they also are good against the tooth-ach, eating ulcers, and the hidden abscesses of the other parts of the mouth. Of aluminous waters.

Salt and nitrous waters shew themselvs sufficiently by their heat: they heat, drie, binde, cleans, discuss, attenuate, resist putrefaction, take away the blackness comming of bruises, heal scabbie and malign ulcers, and help all œdematous tumors. Of salt and nitrous.

Bituminous waters heat, digest, and by long continuance soften the hard'ned sinews; they are different according to the various conditions of the bitumen that they wash, and partake of the qualities thereof. Of bituminous.

Brasen waters, that is, such as retain the qualities of brass; heat, drie, cleans, digest, cut, binde, are good against eating ulcers, fistula's, the hardness of the eie-lids, and they waste and eat away the fleshlie excrescences of the nose and fundament. Of brasen.

Iron water's, cool, drie, and binde powerfully, therefore they help abscesses, hardened milts, the weaknesses of the stomach and ventricle, the unvoluntarie shedding of the urine, and the too much flowing terms, as also the hot distemper of the liver and kidnies. Som such are in Lucan territorie in *Italie*. Of iron.

Leaden water's, refrigerate, drie, and perform such other operations as lead doth; the like may bee said of those waters that flow by chalk, plaster, and other such minerals, as which all of them take and perform the qualities of the bodies by which they pass. Of Leaden.

Hot waters or baths help cold and moist diseases; as the palsie, convulsion, the stiffness and attraction of the nervs, trembling, palpitations, cold distillations upon the joints, the inflations of the members by a dropsie, the jaundis by obstruction of a gros, tough, and cold humor, the pains of the sides, colick, and kidnies, barrenness in women, the suppression of their courses, the suffocation of the womb, causless wearines: those diseases that spoil the skin; as tetters, the leprosie of both sorts, the scab, and other diseases arising from a gros, cold, and obstructing humor, for they provoke sweats. Of hot baths

Yet such must shun them as are of a cholerick nature, and have a hot liver, for they would caus a *Cachexia* and dropsie by over-heating the liver. Cold waters or baths heal the hot distemper of the whole bodie and each of the parts thereof, and they are more frequently taken inwardly then applied outwardly; they help the laxness of the bowels, as the resolution of the retentive faultie of the stomach, entrals, kidnies, bladder, and they also add strength to them. Wherefore they both temper the heat of the liver, and also strengthen it, they staie the *Diarrhœa*, Dysenterie, Courses, unvoluntarie shedding of urine, the *Gonorrhœa*, Sweats, and Bleedings. In this kinde are chiefly commendable the waters of the Spaw in the countrie of *Liege*, which inwardly and outwardly have almost the same facultie, and bring much benefit without anie inconvenience, as those that are commonly used in the drinks and broths of the inhabitants. To whom hurtful. The faculties of cold-baths. The Spaw.

In imitation of natural baths, there may in want of them bee made artificial ones, by the infusing and mixing the powders of the formerly described minerals; as, Brimstone, Alum, Nitre, *Bitumen*: also you may manie times quench in common or rain-water, iron, brass, silver and gold heated red hot, and so give them to bee drunk by the patient, for such waters do oft-times retein the qualities and faculties of the metals quenched in them, as you may perceiv by the happie succes of such as have used them against the Dysenterie. Of artificial baths.

Besides these, there are also other baths made by art of simple water, somtimes without the admixture of anie other thing, but otherwhiles with medicinal things mixed therewith, and boiled therein. But after what manner soever these bee made, they ought to bee warm, for warm-water humect's, relaxe's, mollifie's the solid parts, if at anie time they bee too drie, hard, and dens; by the ascititious heat it open's the pores of the skin, digest's attract's, and discusses suliginous and acrid excrements remaining between the flesh and the skin. It is good against sun-burning and wearines, whereby the similar parts are dried more then is fit. To conclude, whether wee bee too hot or cold, or to drie, or bee nauseous, wee finde manifest profits by baths made of sweet or warm-water, as those that may supplie the defect of frictions and exercises: for they bring the bodie to a mediocritie of temper, they increas and strengthen the native color, and by procuring sweat discuss flatulencies: therefore they are verie useful in hectick fevers, and in the declension of all fevers, and against raving and talking idlely, for the procureing sleep. But becaus water alone cannot long adhere to the bodie, let oil bee mixed or put upon them, which may hold in the water, and keep it longer to the skin. The faculties of a bath of warm-water. Why wee put oil into baths.

These baths are good against the inflammations of the lungs and sides, for they mitigate pain, and help forward that which is suppurated to exclusion, when as general remedies according to art have preceded, for otherwise they will caus a greater defluxion on the afflicted parts:

for a bath (in *Galen's* opinion) is profitably used to diseases when as the morbifick matter is concocted. To this purpose is chosen rain-water, then river-water, so that it bee not muddie, and then fountain-water; the water of standing-lakes and fens is not approoved of, for it is fit that the water which is made choise of for a bath of sweet water, should bee light and of subtil parts, for baths of waters which are more then immoderately hot or cold yeeld no such commoditie; but verily they hurt in this, that they shut up or close the pores of the bodie, and keep in the suliginous excrements under the skin; other baths of sweet or fresh water consist of the same matter as fomentations do, whence it is that som of them relax, others mitigate pain, others cleans, and othersom procure the courses, that is compounded of a decoction of ingredients or plants having such operations. To these there is somtimes added wine, other whiles oil, somtimes fresh butter or milk, as when the urine is stopped, when nephritick pains are violent, when the nervs are contracted, when the habit of the bodie waste's and wrinkles with a hectick drines, for this corrugation is amended by relaxing things, but it is watred, and as it were fatted by humecting things, which may penetrate and transfuse the oilie or fattie humiditie into the bodie thus rarified and opened by the warmnes of a bath.

Anodyne baths are made of a decoction of medicines of a middle nature, such as are temperate and relaxing things, with which wee may also somtimes mix resolving things; they are boiled in water and wine, especially in pains of the colick proceeding from vitreous phlegm, or gros and thick flatulencies conteined or shut up in the bellie, kidnies, or womb. In such baths it is not fit to sweat, but onely to sit in them so long until the bitternes of the pain bee asswaged or mitigated, lest the powers, weakned by pain, should bee more resolved by the breaking forth of sweat: emollients are somtime mixed with gentle detergents, when as the skin is rough and cold, or when the scails or crust of scabs is more hard then usual, then in conclusion, wee must com to strong detersives and driers; lastly to drying and somwhat astrictive medicines so to strengthen the skin, that it may not yeeld it self so easie and open to receiv defluxions. By giving you one example the whole manner of prescribing a bath may appear.

Why wee must not continue in the bath till wee sweat.

A mollifying and anodyne bath.

℞. *rad. lilior. abbor. bismalv. an.* ℔ii. *malv. pariet. violar. an.* mß *sem. lini, fænug. bismalv. an.* ℔i. *flor. cham. melil. aneth. an.* p vi. *fiat decoctio in sufficienti aquæ quantitate, cui permiscito olei liliorum & lini ana,* ℔ii. *fiat balneum in quo diutius natet æger.*

Cautions to bee observed in the use of baths.

Baths though noble remedies approoved by use and reason, yet unles they bee fitly and directly used in time, plentie, and qualitie, they do much harm; for they cause shakings and chilnes, pains, densitie of the skin, or too much rarefaction thereof, and oft-times a resolution of all the faculties. Wherefore a man must bee mindeful of these cautions before hee enter into a bath: First, that there bee no weaknesse of anie noble and principal bowel, for the weak parts easily receiv the humors which the bath hath diffused and rarified, the waies lying open which tend from the whole bodie to the principal parts. Neither must there bee anie plentie of crude humors in the first region, for so they should bee attracted and diffused over all the bodie: therefore it is not onely fit that general purgations should precede, but also particular by the bellie and urine: besides, the patient should bee strong, that can fasting endure a bath as long as it is needful. Lastly, the bath ought to bee in a warm and silent place, lest anie cold air by it's blowing, or the water by it's cold appulse, cause a shivering or shaking of the bodie whence a fever may ensue.

The fittest time for bathing.

The morning is a fit time for bathing, the stomach beeing fasting and emptie, or six hours after meat, if it bee requisite that the patient should bathe twice a daie, otherwise the meat yet crude would bee snatched by the heat of the bath out of the stomach into the veins and habit or the bodie. Manie, of all the seasons of the year, make choise of the spring and end of summer and in these times they chuse a clear daie, neither troubled with stormie windes, nor too sharp an air. As long as the patient is in the bath, it is fit that hee take no meat, unles peradventure to comfort him hee take a little bread moistened in wine, or the juice of an orange, or som damask-prunes to quench his thirst: his strength will shew how long it is fit that hee should staie in, for hee must not staie there to the resolution of his powers, for in baths the humid and spirituous substance is much dissipated. Comming forth of the bath, they must presently get them to bed, and bee well covered, that by sweating, the excrements, drawn unto the skin by the heat of the bath, may break out: the sweat cleansed, let them use gentle frictions, or walking, then let him feed upon meat of good juice and easie digestion, by reason that the stomach cannot but bee weakned in som som sort by the bath.

How to order the patient comming forth of the bath.

That quantitie of meat is judged moderate, the weight whereof shall not oppress the stomach: venerie after bathing must not bee used, becaus to the resolution of the spirit by the bath, it add's another new cause of further spending or dissipating them. Som wish those that use the bath by reason of som contraction, pain, or other affects of the nervs; presently after bathing, to dawb or besmear the affected nervous part with the claie or mud of the bath, that by making it up as it were in this paste, the virtue of the bath may work more effectually, and may more throughly enter into the affected part.

These cautions beeing diligently observed, there is no doubt but the profit by baths will bee great and wonderful: the same things are to bee observed in the use of stoves or hot-houses, for the use and effect of baths and Hot-houses is almost the same, which the antients therefore used by turn, so that comming forth of the bath they entred a stove and called it also

by

by the name of a bath, as you may gather from sundrie places of *Galen* in his *Methodus med.* wherefore I think it fit in the next to speak of them.

CHAP. XLIII.

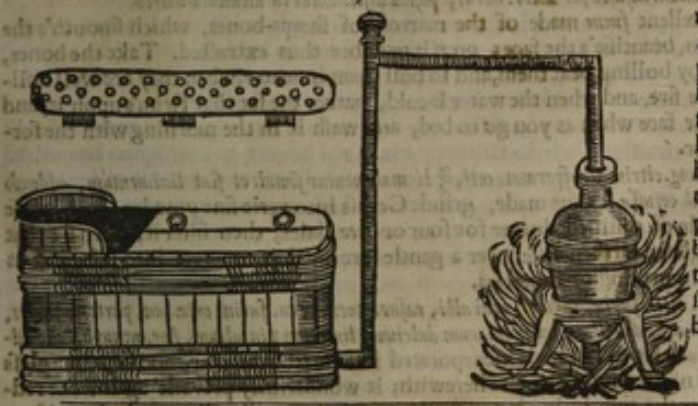
Of Stoves or Hot-houses.

STOves are either drie or moist: Drie, by raising a hot and drie aerie exhalation, so to imprint their faculties in the bodie, that it thereby waxeth hot, and the pores beeing opened, run down with sweat. There are divers waies to raise such an exhalation: at *Paris*, and wheresoever there are stoves or publick hot-houses, they are raised by a clear fire put under a vaulted fornace, whence it beeing presently diffused, heat's the whole room; Yet everie one may make himself such a stove as hee shall judge best and fittest. The differences of Stoves. How made.

Also you may put red hot cogle-stones or bricks into a tub, having first laid the bottom thereof with bricks or iron-plates, and so set a seat in the mid'st thereof, wherein the patient sitting, well covered with a canopie drawn over him, may receiv the exhalation arising from the stones that are about him, and so have the benefit of sweating: but in this case wee must oft look to and see the patient, for it somtimes happen's that som, neglected by their keepers otherwise emploied, becoming faint, and their sens failing them by the dissipation of their spirits by the force of the hot exhalation, have sunk down with all their bodies upon the stones lying under them, and so have been carried half dead and burn't into their beds. Som also take the benefit of sweating in a fornace or oven, as soon as bread is drawn out thereof. But I do not much approov of this kind of sweating, becauf the patient cannot as hee will, much less as hee pleaseth, lie or turn himself therein.

Humid stoves or sudatories are those wherein sweat is caussed by a vapor or moist heat: this vapor must bee raised from a decoction of roots, leavs, flowers, and seeds, which are thought fit for this purpose; the decoction is to bee made in water or wine, or both together. Therefore let them all bee put into a great vessel well luted, from the top of whose cover iron or tin-pipes may com into the bathing-tub standing near thereto, between the two bottoms thereof, by means whereof the hot vapor may enter thereinto, and diffuse it self therein. Now it is fit the bathing-tub should bee furnished with a double bottom, the one below and whole, the other somwhat higher and perforated with manie holes, whereupon the patient sitting may receiv a sudorifick vapor over all his bodie: now this vapor, if at anie time it becom too hot, must bee tempered by opening the hole, which must for the same purpose bee made in the top of the pipe, that so it may bee opened and shut at pleasure. In the interim the tub shall bee closely covered wherein the patient sit's, hee putting forth onely his head, that so hee may draw in the cool air. In defect of such pipes, the herbs shall bee boiled by themselvs in a caldron or kettle, and this shall bee set thus hot into the bathing-tub at the patient's feet, and so by casting into it heated stones, a great and sudorifick vapor shall bee raised. A vaporous stove or bath

The delineation of a bathing Tub, having a double bottom, with a vessel near thereto, with pipes comming therefrom, and entring between the two bottoms of the Tub.



CHAP. XLIV.

Of Fuci, *that is washes, and such things for the smoothing and beautifying of the skin.*

THis following discourse is not intended for those women which addicted to filthie lust, seek to beautifie their faces, as baits and allurements to filthie pleasures: but it is intended for those onely, which the better to restrain the wandring lusts of their husbands, may endevour by art to take away those spots and deformities which have happened to fall on their faces either by accident or age.

The color that appear's in the face, either laudable or illaudable, abundantly shew's the temper both of the bodie, as also of those humors that have the chief dominion therein: for everie humor die's the skin of the whole bodie, but chiefly of the face with the color thereof: for choler bearing swaie in the bodie, the face look's yellowish; phlegm ruling, it look's whitish or pale; if melancholie exceed, then blackish or swarth; but if blood have As the color of the skin is such is the humor that is thereunder.

have the dominion, the color is freſh and red. Yet there is other things happening externally which change the native color of the face, as ſun-burning, cold, pleaſure, ſorrow, fear, watching, faſting, pain, old diſeaſes, the corruption of meats and drinks: for the flouriſhing color of the cheeks is not onely extinguiſhed by the immoderate uſe of vineger, but by drinking of corrupt waters the face becom's ſwoln and pale.

On the contrarie, laudable meats and drinks make the bodie to bee well colored and comly, for that they yield good juice, and conſequently a good habit. Therefore if the ſpots of the face proceed from the plenitude and ill diſpoſition of humors, the bodie ſhall bee evacuated by blood-letting; if from the infirmitie of anie principal bowel, that muſt firſt of all bee ſtrengthened; but the care of all theſe things belong's to the Phyſician: wee here onely ſeek after particular remedies which may ſmooth the face, and take away the ſpots, and other defects thereof, and give it a laudable color.

Waters wherewith to waſh the face.

Firſt the face ſhall bee waſhed with the water of lillie-flowrs, of bean-flowers, water-lillies, of diſtilled milk, or elſ with the water wherein ſom barlie or ſtarch hath been ſteeped. The dried face ſhall bee anointed with the ointments preſently to bee deſcribed; for ſuch waſhing cleanſeth and prepareth the face to receiv the force of the ointments, no otherwiſe then an alumed lee prepair's the hairs to drink up and retein the color that wee deſire. Therefore the face beeing thus cleanſed and prepared, you may uſe the following medicines, as thoſe that have a facultie to beautifie, extend, and ſmooth the skin: as,

Compound liquors wherewith to waſh the face.

℞. *gum. tragacanth. conquaſſ.* ʒii. *diſtemperentur in vaſe vitrio cum* ℔ ii. *aquæ communis, ſic gummi diſſolventur, inde albeſcet aqua.* Or elſ. ℞. *lithargyri auri,* ʒii. *ceruſ. & ſalis com. an.* ʒ ß. *aceti aquæ plantag. an.* ʒ ii. *caphur.* ʒ ß. *macerentur lithargyros & ceruſa in aceto ſeorſim per tres aut quatuor horas, ſal verò et camphora in aqua quam inſtituto tuo aptam delegeris:* then filter them both ſeveral, and mix them together beeing ſo filtred, when as you would uſe them.

Virgin's milk.

℞. *lactis vaccini,* ℔ ii. *aranciorum et limon. an.* nu. iv. *ſaccari albiſſimi, et aluen, roch. an.* ʒ i. *diſtillentur omnia ſimul:* let the limmons and oranges bee cut into ſlices, and then bee infuſed in milk, adding thereto the ſugar and alum; then let the mall bee diſtilled together in *balneo Mariæ*; the water that com's thereof will make the face ſmooth and lovelie. Therefore about bedtime it will bee good to cover the face with linnen-clothes dipped therein. A water alſo diſtilled of ſnails gathered in a vine-yard, juice of limmons, the flowers of white mullein mixed together in equal proportion with a like quantitie of the liquor contained in the bladders of Elm-leavs, is verie good for the ſame purpoſe. Alſo this,

℞. *micæ panis albi,* ℔ iv. *flor. fabar. roſar. alb. flor. nenuph. lilior. & in ireos, an.* ℔ ii. *lactis vaccini,* ℔ vi' *ova.* nu. viii. *aceti opt.* ℔ i. *diſtillentur omnia ſimul in alembico vitreo, & fiat aqua ad faciei et manuum lotionem.* Or, ℞. *olei de tartaro,* ʒ iii. *mucag. ſem. pſilii,* ʒ i. *ceruſ. in oleo roſ. diſſolut.* ʒ ß. *borac. ſal. gem. an.* ʒ i. *fiat linimentum pro facie.* Or, ℞. *caponem vivum, et caſeum ex lacte caprino recentur confectum, limon.* nu. iv. *ovor.* nu. iv. *ceruſ lot. in aq. roſar.* ʒ ii. *boracis,* ʒ i ß. *camph.* ʒ ii. *aq. flor. fabar.* ℔ iv. *fiat omnium infuſio per* xxiv. *horas, poſtea diſtillentur in alembico vitreo.*

The marrow of ſheeps-bones good to ſmooth the face.

There is a moſt excellent *fucus* made of the marrow of ſheeps-bones, which ſmooth's the roughneſs of the skin, beautifie's the face; now it muſt bee thus extracted. Take the bones, ſevered from the fleſh by boiling, beat them, and ſo boil them in water, when they are well boiled, take them from the fire, and when the water is cold, gather the fat that ſwim's upon it, and therewith anoint your face when as you go to bed, and waſh it in the morning with the formerly preſcribed water.

How to make *Salceruſſæ.*

℞. *ſalis ceruſſ.* ʒ ii. *ung. citrin. vel ſpermat. ceti,* ʒ i. *malaxentur ſimul. et fiat linimentum, addendo olei ovor.* ʒ ii. The *Sal ceruſſæ* is thus made, grinde Ceruſs into verie fine powder, and infuſe ℔ i. thereof in a pottle of diſtilled vineger for four or five daies, then filter it, then ſet that you have filtred in a glaſed earthen veſſel over a gentle fire until it concrete into ſalt, juſt as you do the *capitellum* in making of cauteries.

℞. *excrementi lacert. oſſis ſepiæ, tartari, vini albi, raſur. corn. cerv. farin. oriz. an. partes æquales, fiat pulvis, infundatur in aqua diſtillata amygdalarum dulcium, limacum vinialium, flor. nenuph. huic addito mellis albi par pondus:* let them bee all incorporated in a marble mortar, and kept in a glaſs or ſilver veſſel, and at night anoint the face herewith; it wonderfully prevails' againſt the redneſs of the face, if after the annointing it you ſhall cover the face with a linnen cloth moiſtened in the former deſcribed water.

℞. *ſublim.* ʒ i. *argent. viv. ſaliv. extinct.* ʒ ii. *margarit. non perforat.* ʒ i. *caph.* ʒ i ß. *incorporentur ſimul in mortario marmoreo, cum piſtillo ligneo, per tres horas ducantur et fricentur, reducantúrque in tenuiſſimum pulverem, confectus pulvis abluatur aquâ myrti et deſiccetur, ſervetúrque ad uſum, adde foliorum auri et argenti,* nu. x. When as you would uſe this powder, put into the palm of your hand a little oil of maſtic, or of ſweet-almonds, then preſently in that oil diſſolv a little of the deſcribed powder, and ſo work it into an ointment, wherewith let the face bee anointed at bed-time: but it is fit firſt to waſh the face with the formerly deſcribed waters, and again in the morning when you riſe.

How to paint the face.

When the face is freed from wrincles and ſpots, then may you paint the cheeks with a roſie and flouriſhing color; for of the commixture of white and red ariſeth a native and beautiful color: for this purpoſe take as much as you ſhall think fit of braſil, and alchunet; ſteep them in alum-water, and therewith touch the cheeks and lips, and ſo ſuffer it to drie in: there is

alſo

also spanish red made for this purpose; others rub the mentioned parts with a sheep's-skin died red: moreover the friction that is made by the hand onely, causeth a pleasing redness in the face, by drawing thither the blood and spirits.

CHAP. XLV.

Of the Gutta Rosacea, *or a fierie face.*

THis treatise of *Fuci* put's mee in minde to saie somthing in this place of helping the preternatural redness which possesseth the nose and cheeks, and oft-times all the face besides, one while with a tumor, otherwhiles without, somtimes with pustles and scabs, by reason of the admixtion of a nitrous and adust humor. Practitioners have termed it *Gutta rosacea*. This shew's both more and more uglie in winter then in summer, becaus the cold closeth the pores of the skin, so that the matter contained thereunder is pent up for want of transpiration, whence it becom's acrid and biting, so that as it were boiling up, it lift's or raiseth the skin into pustles and scabs; it is a contumacious disease, and oft-times not to bee helped by medicine. Why worse in winter then in summer.

For the general method of curing this disease, it is fit that the patient abstein from wine, and from all things in general that by their heat inflame the blood, and diffuse it by their vaporous substance: hee shall shun hot and verie cold places, and shall procure that his bellie may bee soluble, either by nature or art. Let blood first bee drawn out of the *basilica*, then from the *vena frontis*, and lastly from the vein of the nose. Let leeches bee applied to sundrie places of the face, and cupping-glasses with scarification to the shoulders. Diet.

For particular or proper remedies, if the disease bee inveterate, the hardness shall first bee soft'ned with emollient things, then assaulted with the following ointments, which shall bee used or changed by the Chirurgian as the Physician shall think fit. Remedies.

℞. *succi citri*, ℥iii. *cerus. quantum sufficit ad eum inspissandum, argenti vivi cum saliva et sulphure vivo exstincti*, ʒß. *incorporentur simul, et fiat unguentum.* An approved ointment.

℞. *boracis*, ʒ ii. *farin. cicer. et fabar. an.* ʒ i ß. *caph.* ʒ i. *cum melle et succo cepæ fiant trochisci*: when you would use them, dissolv them in rose and plantain-water and spread them upon linnen clothes, and so applie them on the night-time to the affected parts, and so let them oft times bee renued.

℞. *unguenti citrini recenter dispensati*, ℥ ii. *sulphuris vivi*, ℥ ß. *cum modico olei sem. cucurb. et succi limonum, fiat unguentum*; with this let the face be anointed when you go to bed, in the morning let it bee washed away with rose-water, beeing white by reason of bran infused therein: moreover, sharp vineger boiled with bran and rose-water, and applied as before, powerfully take's away the redness of the face.

℞. *cerus. & litharg. auri, sulphuris vivi pulverisati, an*, ℥ ß. *ponantur. in phiala cum aceto & aqua rosarum*: linnen cloths dipped herein shall bee applied to the face on the night, and it shall bee applied to the face on the night, and it shall bee washed in the morning with the water of the infusion of bran: this kind of medicine shall bee continued for a month.

℞. *sanguinis tauri*, ℔ i. *butyri recentis*, ℔ ß. *fiat distillatio, utatur.* The liquor which is distilled for the first daies is troubled and stinking, but these passed, it becometh clear and well smelling. Som boil bran in vineger and the water of water-lilies, and in this decoction they dissolv of *sulphur* and camphire a fit proportion to the quantitie of the decoction, and they applie cloths moistened in this medicine to the face in the evening.

℞ *album. ovor.* nu. ii. *aquæ ros.* ℥ i ß. *succi plantag. & lapath. acut. an.* ℥ i ß. *sublimati*, ℈ i. *incorporentur in mortario marmoreo.* ℞. *axung. porci decies in aceto lotæ*, ℥iv. *argenti vivi*, ℥ i. *aluminis, sulphuris vivi, an.* ʒ i. *pistentur omnia diu in mortario plumbeo, & fiat unguentum; argentum vivum non debet nisi extremo loco affundi.* ℞. *rad. lapath. acut. & aspodel. an.* ℥ ii. *coquantur in aceto scillitico, postea tundantur, et setaceo trajiciantur, addendo auripigmenti*, ʒ ii. *sulphuris vivi*, ʒ x. let them bee incorporated and make an ointment to bee used to drie up the pustles.

℞. *rad. liliorum sub cineribus coctorum*, ℥ iv. *pistillo tusis, et setaceo trajectis, adde butyri recentis, et axung. porci, lotæ in aceto, an.* ℥ i. *sulphuris vivi*, ʒ iii. *camphor.* ℈ iii. *succi limonum quantum sufficit, malaxentur simul et fiat unguentum.* ℞. *lactis virginalis*, ℔ ß. *aluminis*, ℥ ß. *sulphuris vivi*, ℥ i. *succi limonum*, ℥ iv. *salis com.* ʒ. ß. let them all bee distilled in a glass alembick, and the water kept for the forementioned uses. To drie up the pustels.

℞. *lapath. acut. plantagin. et aspodel. an.* ℥ i ß. *olei vitel. ovor.* ℥ i. *terebinth. venet.* ℥ ß. *succi limonum*, ʒ iii. *aluminis combust.* ʒ i. *argenti vivi exstinct.* ℥ i. *olei liliorum*, ℥ ß. *tundantur omnia in mortario plumbeo, addendo sub finem argent. viv. ne mortario adhæreat.* The juice of onions beaten with salt, or the yelks of eggs are good for the same purpose.

For staying and killing of Ring-worms and Tetters, the leavs of hellebore beaten with vineger are good, the milk of the fig-tree is good of it self, as also that of the spurges, or mustard dissolved in strong vineger with a little sulphur. Or, To kill tetters.

℞. *sulphuris, calcanthi, & aluminis, an.* ʒ i. *macerentur in aceto forti, trajiciantur per linteum*; applie the expressed juice. Others macerate an egg in sharp vineger, with coperas and *sulphur vivum* beaten into fine powder, then they strain or press it through a linnen cloth.

But seeing the forementioned medicines are acrid, and for the most part eating and corroding,

ding, it cannot bee but that they must make the skin harsh and rough, therefore to smooth and levigate it again, you shall make use of the following ointment.

To smooth the skin. R. *tereb. ven. tam diu lotæ, ut acrimoniam nullam habeat, butyri salis expertis, an.* ℥ i ß. *olei vitel. ovor.* ℥ i. *axung. porci in aquâ rosarum lotæ,* ℥ ß. *ceræ parum, fiat linimentum ad usum.* To the same purpose you may also make use of som of the forementioned medicines.

CHAP. XLI.

To black the hair.

What things are fit to die the hair. FIRST the hairs, (to take the *fucus* or tincture, and to retain it) must bee prepared with Lie, wherein a little roch-Alum is dissolved. Thus the fattie scales may bee washed and taken away, which hinder, and (as it were) keep away the *fucus*, that it cannot adhere or penetrate into the bodie of the hair. Then must wee com to particular or proper and fitting medicines for this purpose. These ought to bee aromatick and cephalick, and somwhat stiptick, that by their odoriferous & astringent power they may strengthen the animal facultie. Furthermore, they must beof subtil parts, that they may enter even into the inner roots of the hairs.

R. *Sulphuris, vitrioli, gallarum, calcis vivæ, lithargyri, an.* ℥ ii. *scoriæ ferri,* ℥ ß. *in pollinem reducantur, et cum aq. communi incorporentur, ut inde fiat massa:* with this at bed time let the hairs bee rubbed, and in the morning let them bee smoothed with the same.

R. *calcis lotæ,* ℥ i *lithargyri utriusq;* ℥ ß. *cum decocto gallarum, corticum, nucum, fiat massa, addendo olei chamem.* ʒ ii. R. *lytharg. auri,* ℥ ii. *ciner clavellat.* ℥ i ß. *calcis viv.* ʒ i. *dissolve omnia cum urina hominis donec acquirant consistentiam unguenti pro unctione capillorum.* R. *calcis lotæ,* ʒ. ii. *cum decoct. salv. et cort. granat. fiat pasta ad formam pultis satis liquidæ:* let the hair at bed-time bee died herewith, and washed in the morning with wine and water.

How to wash lime. Now the manner of washing lime is thus: Infuse in ten or twelv pints of fair water one pound of lime, then pour out the water by stooping the vessel, putting more in the stead thereof; the third time in stead of common water pour thereon the water of the decoction of sage and galls, let the lime lie therein for so manie hours, then in like manner pour it off by stooping the vessel; and thus you shall have your lime well washed. There is also found a way how to die or black the hair by onely powring of som liquor thereon: as, R. *argenti purissimi,* ʒ ii, *reducantur in tenuissimas laminas, ponantur in ampulla vitrea cum* ʒ ii. *aquæ separationis auri et argenti,* A water to black the hair. *et aquæ rosar.* ʒ vi. The preparing of this water is thus, put into a viol the water of separation and the silver, and set it upon hot coals so to dissolv the silver, which beeing don then take it from the fire, and when it is cold, add thereto the rose-water But if you would black it more deeply, add more silver thereto, if less then a smaller quantitie; to use it, you must steep the comb wherewith you comb your head in this water.

R. *plumbi usti,* ℥ ii. *gallarum non perforat. cortic. nucum, an.* ℥ iii. *terræ sigil ferret. bispan. an.* ℥ ii. *vitriol. rom.* ℥ vi. *salis gem.* ℥ i ß. *caryoph. nucis moscb. an.* ℥ i. *salis ammon. aloes, an.* ʒ ß. *fiat pulvis subtilissimus:* let this powder bee macerated in vinegar for three daies space, then distil it all in an alembick, the water that com's therefrom is good for the foresaid use. The following medicine is good to make the hairs of a flaxen color. R. *flor. genist. stæchad. et cardamom. an.* ℥ i. *lupinor. conquassat. rasur. buxi, corticis citri, rad. gentian. et berber. an.* ℥ i ß. *cum aqua nitri fiat lenta decoctio:* herewith bathe and moisten the hairs for manie daies. To make the hair of a flaxen color.

CHAP. XLVII.

Of Psilothra, *or Depilatories: and also of sweet-waters.*

A depilatorie. MEdicines to fetch off hair, which by the Greeks are termed *Psilothra*, and *Depilatoria* in latine vulgarly, are made as you may learn by these following examples. R. *calcis vivæ,* ℥ iii. *auripigmenti,* ℥ i. let the lime bee quench'd in fair water, and then the orpiment added with som aromatic thing: have a care that the medicine lie not too long upon the part, otherwise it will burn; and this medicine must bee made to the consistence of a pultis and applied warm, first fomenting the part with warm water; for then the hair will fall off by gentle rubbing or washing it with warm water: but if there happen anie excoriation thereupon, you may help it by the use of *unguentum rosatum,* or som other of the like facultie.

Another. R. *calcis viv. aurip. citrin. an.* ℥ i. *amyl. spumæ argent. an.* ℥ ß, *terantur et incorporentur cum aq. com. bulliant simul:* you shall certainly know that it is sufficiently boiled, if putting thereinto a gooses quill, the feathers com presently of: som make into powder equal parts of unquench'd. lime and orpiment, they tie them up in a cloth, with which beeing steeped in water they besmear the part, and within a while after by gently stroaking the head, the hairs fal's away of it self

Sweet-waters. The following waters are verie fitting for to wash the hands, face, and whole bodie, as also linnen, becaus they yield a grateful smel: the first is lavander-water thus to bee made. R. *flor. lavend.* ℔ iv. *aq. rosar. & vini alb an.* ℔ ii. *aq. vitæ,* ℥ iv. *misceantur omnia simul, & fiat distillatio in balneo Mariæ:* the same water may also bee had without distillation, if you put som lavander-flowers in fair water, and so set them to sun in a glass, or put them in *balneo*, adding a little oil of spike and musk. Clove-water is thus made. R. *caryoph.* ℥ ii *aq. rosar.* ℔ ii. *macerentur spatio* xxiv. *horarum, et distillentur in balneo Mariæ.* Sweet-water commonly so called, is made of divers odoriferous things put together; as thus, R. *mentbæ, majoranæ, hyssopi, salviæ, rorismarini, lavendulæ, an.* m ii. *radicis iridis,* ℥ ii. *caryophyllorum, cinamoni, nucis moschatæ ana,* ℥ ß. *limonum,* nu. iv. *macerentur omnia in aqua rosarum, spatio viginti quatuor horarum, distillentur in balneo Mariæ, addendo Moschi,* ϑ ß.

Lavender-water. Clove-water. Sweet-water.

The end of the Twentie sixth Book.

Of DISTILLATIONS.

The Twentie ſeventh Book.

CHAP. I.

What Diſtillation is, and how manie kindes thereof there bee.

HAving finiſh'd the Treatiſe of the faculties of medicines, it now ſeem's requiſite that wee ſpeak ſomwhat of Chymiſtrie and ſuch medicines as are extracted by fire. Theſe are ſuch as conſiſt of a certain fiſt eſſence ſeparated from their earthie impuritie by Diſtillation, in which there is a ſingular, and almoſt divine efficacie in the cure of diſeaſes. So that of ſo great an abundance of the medicines there is ſcarce anie which at this daie Chymiſts do not diſtil, or otherwiſe make them more ſtrong and effectual then they were before. Now diſtillation is a certain Art or way by which the liquor or humid part of things, by the virtue and force of fire or ſom ſemblable heat (as the matter ſhall ſeem to require) is extracted and drawn, beeing firſt reſolved into vapor and then condens'd again by cold. Som call this art *Sublimation* or ſubliming, which ſignifie's nothing elſ, but to ſeparate the pure from the unpure; the parts that are more ſubtil and delicate from thoſe that are more corpulent, groſs and excrementious; as alſo to make thoſe matters whoſe ſubſtance is more groſs, to becom more pure and ſincere, either for that the terreſtrial parts are ill-united and conjoined, or otherwiſe confuſed into the whole and diſperſed by the heat and ſo carried up; the other groſſer parts remaining together in the bottom of the veſſel. Or a diſtillation is the extraction or effuſion of moiſture diſtilling drop by drop, from the noſe of the Alembeck or anie ſuch like veſſels Before this effuſion or falling down of the liquor there goe's a certain concoction performed by the virtue of heat, which ſeparate's the ſubſtances of one kinde from thoſe of another that were confuſedly mixed together in one bodie, and ſo bring's them into one certain form or bodie, which may bee good and profitable for divers diſeaſes. Som things require the heat of a clear fire, others a flame; others the heat of the Sun; others of aſhes, or ſand, or the filings of Iron; others horſ. dung, or boiling water, or the oilie vapor or ſteam thereof. In all theſe kinds of fires, there are four conſiderable degrees of heat. The firſt is conteined in the limits of warmth, and ſuch is warm water, or the vapor of hot water. The ſecond is a little hotter, but yet ſo as the hand may abide it, without anie harm, ſuch is the heat of Aſhes. The third exceed's the vehemencie of the ſecond, wherefore the hand cannot long endure this without hurt, and ſuch is the heat of ſand. The fourth is ſo violent, that it burneth anie thing that commeth near, and ſuch are the filings of Iron.

What diſtillation is.

Four degrees of heat.

The firſt degree is moſt convenient to diſtil ſuch things as are ſubtil and moiſt as flowers. The ſecond ſuch as are ſubtil and drie as thoſe things which are odoriferous and aromatical, as Cinnamom, Ginger, Cloves. The third is fitteſt to diſtil ſuch things as are of a more denſe ſubſtance and fuller of juice; ſuch as are ſom Roots, and gums. The fourth is fit for metals and minerals, as Allum, Vitriol, Amber, Jet, &c. In like manner you may diſtil without heat; as wee uſe to do in thoſe things which are diſtilled by ſtraining, as when the more pure is drawn and ſeparated from that which is moſt unpure and earthie, as wee do in *Lac Virginale*, and other things which are ſtrained through an hypocras-bag, or with a piece of cloth cut in form of a tongue, or by ſettling, or by a veſſel made of Ivie wood: ſomtimes alſo ſomthings may bee diſtilled, by coldneſs and humiditie, and ſo wee make the oil of Tartar, Myrrh and Vitriols, by laying them upon a marble in a cold and moiſt place.

What heat fitteſt for what things.

CHAP. II.

Of the matter and form of Fornaces.

THe matter and form of Fornaces uſe's to bee divers. For ſom Fornaces uſe to bee made of bricks and claie, otherſom of claie onely, which are the better and more laſting, if ſo bee the claie bee fat and well tempered with whites of Eggs and hair. Yet in ſudden occaſions when there is preſent neceſſitie of diſtillation, Fornaces may bee made of bricks, ſo laid together that the joints may not agree, but bee unequal; for ſo the ſtructure will bee the ſtronger. The beſt and fitteſt form of a Fornace for diſtillation is round; for ſo the heat of the fire carried up equally diffuſe's it ſelf everie waie, which happen's not in a Fornace of another figure, as ſquare or triangular, for the corners diſperſ and ſeparate the force of the fire. Their magnitude muſt bee ſuch as ſhall bee fit for the receiving of the veſſel. For their thickneſs; ſo great as neceſſitie ſhall ſeem to requir. They muſt bee made with two bottoms, diſtinguiſh'd as it were into two forges; one below which may receiv the aſhes of the coals or the like other fuel,

The matter the beſt for Fornaces.

A round form the beſt for Fornaces.

fuel, the other above to contein the burning coals or fire. The bottom of this upper must either be an iron-grate, or elſ it must bee perforated with manie holes, that ſo the aſhes may the more eaſily fall down into the bottom, which otherwiſe would extinguiſh the fire; yet ſom Fornaces have three partitions, as the Fornace for reverberation. In the firſt and loweſt the aſhes are received, in the ſecond the coals are put, and in the third the matter which is calcin'd or elſ diſtilled. The third ought to have a ſemicircular cover, that ſo the heat or flame may bee reflected upon the conteined matter. The lower partition ſhall have one or more doors, by which the fallen-down aſhes may bee taken forth. But the upper muſt have but one, whereby the coals or wood may bee put in. But in the top or upper part of the Fornace where it ſhall ſeem moſt fit, there ſhall bee two or three holes made, that by them you may blow the fire, and that the ſmoak may more freely paſs out. But theſe fore-mentioned doors muſt have their ſhutters, much like an oven's mouth. But in defect of a fornace or fit matter to build one withall, wee may uſe a kettle, ſet upon a treefoot, after the manner that wee ſhall preſently declare, when wee com to ſpeak of that diſtillation which is to bee made by *Balneum Mariæ*.

CHAP. III.

Of veſſels fit for Diſtillation.

VEſſels for Diſtillation conſiſt of different matter and form, for they are either of Lead, Tin, or Braſs; or elſ earthen veſſels and theſe are ſomtimes leaded, ſomtimes not: or elſ they are of Gold, Silver, or Glaſs. Now for leaden veſſels they are worſ then the reſt, and utterly to bee refuſed, eſpecially when as the liquors which are drawn by them are to bee taken into the bodie by the mouth, by reaſon of the malignant qualities which are ſaid to bee in Lead; by which occaſion *Galen* condemn's thoſe waters which run, and are conteined in leaden pipes, which by reaſon of their ſaltiſhneſs and acrimonie which ſavor's of quickſilver, they cauſ dyſenteries. Therefore you may perceiv ſuch waters as are diſtilled through a leaden head to bee indued with a more acrid and violentp-iercing vapor, by reaſon the portion of that ſaltiſhneſs diſſolved in them, and as it were ſhaved from the Alembeck or head, defile's the diſtilled liquors, and whiten's and turn's them into a milkie ſubſtance: but copper or braſs-heads are more hurtful then Lead, for they make the waters that com through them to ſavor or participate of braſs. Thoſe that are of gold and ſilver are leſs hurtful; but the greatneſs of the coſt hinder's us from making heads of ſuch metals; therefore wee muſt have a care that our veſſels for diſtillation bee either of potters-metal leaded, or elſ of braſs, or of that jug metal which is commonly called *terra betovacenſis*, and theſe rather then of lead or anie other metal. Verily glaſſes are thought the beſt; and next to them earthen veſſels leaded, then of jug-metal, and laſtly theſe of tin. There is great varietie of veſſels for diſtillation in form and figure; for ſom are of an oval or cylindrical figure, that is, of a round and longiſh; others are twined and crooked, others of other ſhapes, as you may ſee in the beaks of the Chimiſts. Of this almoſt infinite varietie of figures I will in fit place give you the delineation and uſe of ſuch as ſhall ſeem to bee moſt neceſſarie.

Leaden veſſels ill.

Braſs worſ.

The beſt veſſels for diſtillation.

CHAP. IIII.

What things are to bee conſidered in diſtillation.

FIrſt make choiſ of a fit place in your houſ for the fornace, ſo that it may neither hinder anie thing, nor bee in danger of the falling of anie thing that ſhall lie over it. When you ſhall diſtil anie thing of a malign or venenate qualitie, yee ſhall ſtand by it as little as you may, leſt the vapor ſhould do you anie harm: when you provide glaſs-veſſels for diſtillation, make choiſ of ſuch, as are exquiſitely baked, without flaws or cracks, and ſuch as are everie where ſmooth. Let not the fire at firſt bee verie violent, not onely for fear of breaking the veſſels, but alſo for that the firſt fire in diſtillation muſt bee gentle, and ſo increaſed by little and little. The things to bee diſtilled, ought not to bee put in too great quantitie into the bodie of the Still, leſt they ſhould riſe up or flie over. Hot things that they may bee more effectual muſt bee twice or thriſe diſtilled, by powring upon them their own diſtilled water or other freſh materials, or elſ by diſtilling them ſeverally and by themſelvs: of this kinde are gums, wax, fats, or oils.

Hot things muſt bee often diſtilled.

But in each other repeated diſtillations you muſt ſomthing leſſen the force of the fire, for the matter attenuated by the former diſtillation cannot afterward endure ſo great heat: but aromatick things, as Cloves, Cinnamom, &c. as alſo the chimical oils of Sage, Roſemarie, Tyme, &c. ought not to bee diſtilled or rectified over again, for that wee muſt preſently after the firſt diſtillation have a diligent care to ſeparate them from the phlegm, that is, the more watrie ſubſtance of the whole liquor, to which purpoſe wee muſt have regard to that which is diſtilled, for there are ſom things which ſend over their phlegm as Vineger; others, wherein it com's laſt, as * *aqua vitæ*.

* By aqua vitæ in this and moſt other places is meant nothing but the ſpirit of wine.

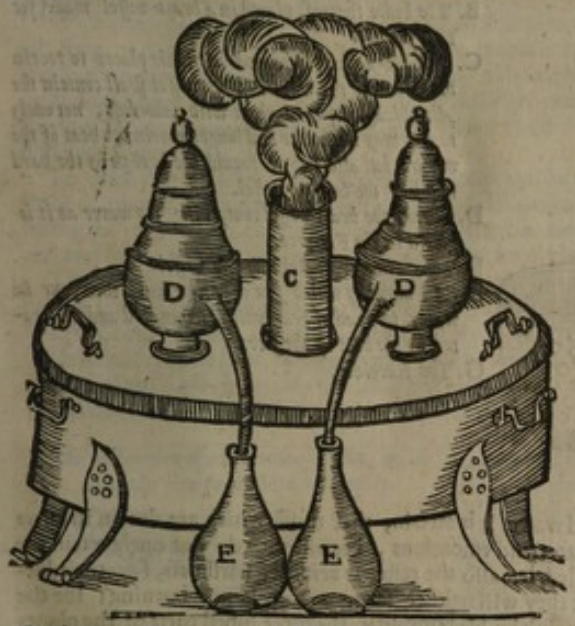
If you would give to things to bee diſtilled another taſte or ſmell then that which they have naturally, you may mix with them ſom odoriferous thing, as Cinnamom, Camphire, or Muſk, or the like, as you pleaſ, and ſo diſtil them together. The diſtilled liquors are drawn by the heat

heat of ashes or sand, savor of and retain a certain *empyreuma*, or smatch of the fire; for the helping of which, you shall put them into glasses close stopt, and so expose them to the sun, and now and then open the glasses that this fierie impression may exhale, and the *phlegmon* bee consumed, if that there shall bee anie. But though in all distillation, there are manie things to bee observed, yet are there two things, chiefly worthie of note. The first is, the matter that is to bee distilled and wrought upon, that is, of what kinde it is, and what the nature thereof may do and suffer. The other is the Fornace, which ought to bee provided of a convenient matter and figure of that which is to bee distilled: for you cannot draw anie thing of anie matter, neither of everie mixture beeing distilled can you rightly expect oil or water. For mix't bodies do not consist of an equal portion of the four Elements, but som are more aierie, others more fierie, som participate more of the water, others more of the earth, and that presently from their first original. Therefore as watrie things yield more water; so aierie and fierie things yield more oil when they are distilled; neither are all instruments fit for the extracting of everie liquor. Moreover you must note, that the waterie liquor somtimes com's forth in the first place, and presently after by the help of a stronger fire follow's the oilie, which wee finde happen's as often as the plant or parts of the plants, which are distilled, are of a cold temperament; for in hot things it happen's otherwise, for the first liquor which com's forth is oilie, and the following waterish.

CHAP. V. *Of what fashion the vessels for the distilling of waters ought to bee.*

FOr the distilling of anie kinde of waters, two kinde of vessels are necessarie, which are comprehended under this one generall name of an Alembick. They call one of them the bodie, or conteining vessel, the other the head, that is, the cap or top wherein the ascending vapors are condensated or turned into water. It is called the head, because it stands over the bodie, like as an head; from the head there com's out a pipe or nose whereby the distilled liquor flow's drop by drop into the receiver, as you may see by the figure. The parts of an Alembick.

The Fornace for a Balneum Mariæ *with the Alembeck and their receivers.*

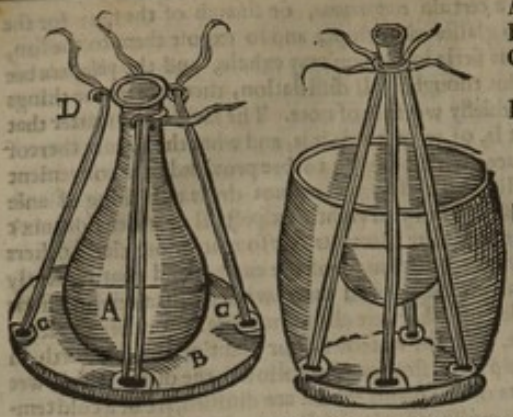


A. *Shew's a brass kettle full of water.*
B. *The cover of the kettle perforated in two places to give passage forth to the vessels.*
C. *A pipe or Chimnie added to the kettle, wherein the fire is conteined to heat the water.*
D. *The Alembick consisting of his bodie and head.*
E. *The receiver whereinto the distilled liquor run's.*

The effigies of another balneum Mariæ, *not so easily to bee removed as the former.*

A. *Shew's the vessel or Copper that contein's the water.*
B. *The Alembick set in water.*

But lest the bottom of the Alembick beeing half full, should float up and down in the water, and so stick against the sides of the Kettle; I have thought good to shew you the waie and means to prevent that danger.



A. *Shew's the vessel or glass-Alembick.*
B. *A plate of lead whereon it stand's.*
C. *Strings that binde the Alembick to the plate.*
D. *Rings through which the strings are put to fasten the Alembick.*

You may distil the liquors of things by the vapor or stream of boiling water, if so bee that you bee provided of Vessels and forms made after this following manner,

A Fornace with his vessels to distil liquors with the steam of boiling water.

A. *Shew's the head of the Alembick.*
B. *The bodie thereof, placed in a brass-vessel made for that purpose.*
C. *A brass-vessel perforated in manie places to receiv the vapor of the water. This vessel shall contein the Alembick compassed about with saw-dust, not onely that it may the better and longer retein the heat of the vapor, but also lest it should bee broken by the hard touch of the brasen vessel.*
D. *Shew's the brass vessel containing the water as it is plac'd in the Fornace.*
E. *The Fornace, conteining the vessel.*
F. *A Funnel by which you may now and then pour in water, instead of that which is vanish'd and dissipated by the heat of the fire.*
G. *The Receiver.*

Why those things that are distilled in *Balneo* retein more of the strength of things.

Now for the faculties of distilled waters it is certain, that those which are drawn in *balneo Mariæ* or a double vessel, are far better and efficacious, becaus they do not onely retein the smell of the things which are distilled, but also the taste, as aciditie, harshness, sweetness, bitterness, and other qualities, so that they will neither savor of smoak nor burning; for the milde and gentle heat of a bath contein's by his humiditie, the more subtil parts of the plants that are distilled, that they may not bee dissipated and exhaled, contrarie to which it usually happen's in things which are distilled by the burning heat of wood or coals. For these have a certain nitrous and acrid taste, savoring of the smoak of fire. Besides, they acquire a malign qualitie from the vessels out of which they are distilled, especially if they bee of Lead, whence they contract qualities hurtful to the principal, vital, and natural parts.

Therefore the plants which are thus distilled, if they bee bitter by nature, presently becom insipid, as you may perceiv by wormwood-water thus distilled. Those things which are distilled in *Balneo Mariæ* are contained in a glass-vessel, from which they can borrow no malign qualitie. Therefore the waters so drawn are more effectual and pleasing in taste, smel, and sight. You may draw waters not onely from one kinde of plant, but also from manie compounded and mixed together: of these som are alimentarie, others medicinal, yea and purging; others acquir'd for smell, others for washing or smoothing of women's faces, as wee shall shew hereafter.

CHAP. VI.

How the materials must bee prepared before Distillation.

THings before they bee put into the Alembick must undergo a preparation, that is, they must bee cut small, beaten and macerated, that is, steeped in som liquor, that so they may bee the more easily distilled and yield the more water, and retein their native smell and

and faculties; yet such preparation is not convenient for all things; for there bee som things which need no infusion or maceration, but must rather bee dried before they bee distilled, as Sage, Tyme, Rosemarie, and the like, by reason of their too much humiditie; it will bee sufficient to sprinkle other things with som liquor onely. In this preparation there are two things observable, to wit, the time of the infusion, and condition of the liquor wherein these things ought to bee infused. The time of the infusion is different according to the varietie of the matter to bee macerated; for things that are hard, solid, drie or whole, must bee longer macerated, then such as are tender, freshly gathered or beaten: whence it is that roots and seeds require a longer time of infusion; flowers and leavs a shorter, and the like of other things. The liquors wherein infusion must bee made, ought to bee agreeable to the things infused. For hot ingredients require hot liquors, and cold such as are cold wherein they may bee infused.

What things need not to bee macerated before they bee dissolved.

Such things as have not much juice, as Betonie, wormwood and the like, or which are verie odoriferous, as all aromatick things, would bee infused in wine; so to preserv their smell, which otherwise by the force of the fire, by reason of the tenuitie of the substance easily vanishe's. But if wee desire that the distilled liquor should more exactly retein and have the facultie of the things whereof it is distilled, then must you infuse it in the juice thereof, or som such appropriate liquor, that it may swim in it whilest it is distilled, or at least let it bee sprinkled therewith.

The macerration of plants in their own juice.

CHAP. VII.

Of the Art of distilling of waters.

BEfore I describe the manner how to distil waters, I think it not amiss briefly to reckon up how manie sorts of distilled waters there bee, and what the faculties of them are. Therefore of distilled waters som are medicinal, as the waters of Roses, Plantain, Sorrel, Sage, and the like: others are alimentarie, as those waters that wee call restauratives; othersom are composed of both, such as are these restaurative waters which are also mixed with medicinal things; others are purging, as the distilled water of green and fresh Rubarb; othersom serv for smoothing the skin, and others for smell; of which sort are those that are distilled of aromatick things.

The varities of stilled waters.

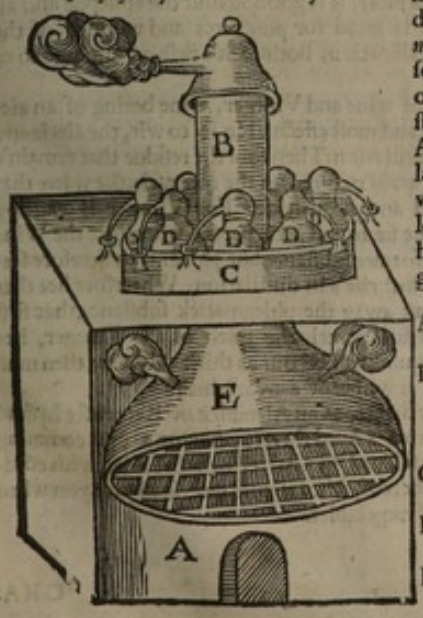
To distil Rose-water, it will bee good to macerate the Roses before you distil them for the space of two or three daies, in som formerly distilled Rose-water, or their pressed-out juice, luting the vessel close; then put them into an Alembic closely luted to his head and his Receiver, and so put into a *Balneum Mariæ*, as wee have formerly described.

Rose-water.

The distilled Alimentarie liquors are nothing elſ than those that wee vulgarly call Restauratives; this is the manner and art of preparing them. Take of Veal, Mutton, Kid, Capon, Pullet, Cock, Patridg, Phesant, as much as shall seem fit for your purpose: cut it small, and lest it should require heat, or *empyreuma* from the fire, mix therewith a handful of French-Barlie, and of red Rose-leavs drie and fresh, but first steeped in the juice of Pomgranats, or citrons and Rosewater with a little Cinnamom, as much.

Restauratives.

The delineation of a Balneum Mariæ, *which may also serv for to distil with ashes.*



But if you desire that this restaurative should not onely bee alimentarie, but also medicinal, you shall add thereto such things as shall resist the diseas, such as are Cordial powders as of *El. Diamargarit. frigid. De gemmis, Aromaticum Rosat.* Conserv of Bugloss, Borrage, roots, herbs, seeds and other things of that kinde. But if it bee in a pestiferous season, Triacle, Mithridate and other Antidotes shall bee added; each of these shall bee laid in ranks or orders one over another, which is vulgarly termed *stratum super stratum*, in a glas Alembick, and distilled in *balneo Mariæ* with the heat of Ashes, or elſ of warm sand, as the figure shew's.

A. *Shew's the Fornace with the hole to take forth the the Ashes.*

B. *Shew's another Fornace, as it were set in the other: now it is of Brass, and run's through the mid'st of the kettle made also of brass, that so the conteined water or ashes may bee the more easily heated.*

C. *The kettle wherein the water, ashes, or sand are conteined.*

D. *The Alembick set in the water, ashes, or sand, with the mouths of the receivers.*

E. *The bottom of the second brass Fornace, whose top is marked with* B. *which contein's the fire.*

Another waie of making restaurative Liquors.

There may bee made other restauratives in shorter time with less labor and cost. To this purpose the flesh must bee beaten and cut thin, and so thrust through with a double thred, so that the pieces thereof may touch each other; then put them into a glass, and let the thred hang out; so stop up the glass close with a linnen cloth, Cotten or Tow, and lute it up with paste made of meal and the whites of eggs; then set it up to the neck in a kettle of water, but so that it touch not the bottom, but let it bee kept upright by the formerly-described means; then make a gentle fire there-under, until the conteined flesh by long boiling shall bee dissolved into juice, and that will commonly bee in som four hours space. This beeing don, let the fire bee taken from under the kettle, but take not forth the glass before the water bee cold, lest it beeing hot should bee broken by the sudden appulse of the cold air. Wherefore when as it is cold, let it bee opened, and the thred with the pieces of flesh bee drawn forth, so that onely the juice may bee left remaining; then strain it through a bag, and aromatize it with Sugar and Cinnamom, adding a little juice of Citron, Verjuice or Vineger, as it shall best like the patient's palate.

After this manner you may quickly, easily, and without great cost have and prepare all sorts of restauratives aswell medicated as simple. But the force and facultie of purging medicines is extracted after a clean contrarie manner then the oils and waters which are drawn of Aromatick things, as Sage, Rosemarie, Tyme, Aniseeds, Fennel, Cloves, Cinnamom, Nutmegs, and the like. For the strength of these, as that which is subtil and aierie, flie's upwards in distillation; but the strength of purging things, as Turbith, Agarick Rubarb and the like, subside in the bottom. For the purgative facultie of these purgers inseparably adhere's to the bodies and substances.

Now for sweet waters and such as serv to smooth the skin of the face, they may bee distilled in *Balneo Mariæ* like as Rose-water.

CHAP. VIII.

How to distil Aqua vitæ or the spirits of Wine.

TAke of good White or Claret-wine or Sack which is not sowr nor mustie, nor otherwise corrupt, or of the Lees, that quantitie which may serv to fil the vessel wherein you make the distillation to a third part; then put on your head furnished with the nose or pipe, and so make your distillation in *Balneo Mariæ*. The oftner it is distilled, or (as they term it) rectified, the more noble and effectual it becom's. Therefore som distil it seven times over.

Spirit of wine seven times rectified.

At the first distillation it may suffice to draw a fourth or third part of the whole; to wit, of twentie four pintes of Wine or Lees, draw six or eight pintes of distilled liquor.

At the second time the half part of that is three or four pintes.

At the third distillation the half part again, that is, two pints; so that the oftner you distil it over, the less liquor you have, but it will bee a great deal the more efficacious. I do well like that the first distillation bee made in Ashes; the second in *Balneum Mariæ*. To conclude, that *aqua vitæ* is to bee approoved of, neither is it anie oftner to bee distilled, which put into a spoon or saucer, and there set on fire, burn's wholly away and leav's no liquor, or moisture in the bottom of the vessel; if you drop a drop of oil into this same water, it continually fal's to the bottom; or if you drop a drop into the palm of your hand, it will quickly vanish away, which are two other notes of the probation of this liquor.

The faculties of the spirit of wine.

The faculties and effects of *aqua vitæ* are innumerable, it is good against the epilepsie and all cold diseases, it asswage's the pains of the teeth, it is good for punctures and wounds of the Nervs, faintings, swoonings, gangreens and mortification, both of it's flesh, as also put to other medicines for a vehicle.

There is this difference between the distilling of wine and Vineger, wine beeing of an aierie and vaporous substance, that which is the best and most effectual in it, to wit, the aierie and fierie liquor, com's from it presently at the first distillation. Therefore the residue that remain's in the bottom of the vessel, is of a cold drie and acrid nature; on the contrarie, the water that com's first from Vineger beeing distilled is insipid and flegmatick. For Vineger is made by the corruption of wine, and the segregation of the fierie and aerie parts; wherefore the Wine becoming sowr, there remain's nothing of the former substance but phlegm; wherefore seeing phlegm is chiefly predominant in Vineger, it first rise's in distillation. Wherefore hee that hope's to distil the spirit of Vineger, hee must cast away the phlegmatick substance, that first substance that first rise's, and when by his taste hee shall perceiv the spirit of the Vineger, hee shall keep the fire there-under, until the flowing liquor shall becom as thick as honie; then must the fire bee taken away, otherwise the burning of it will caus a great stinch.

The distilling of Wine and Vineger is different.

The vessels fit to distil *aqua vitæ* and Vineger are divers, as an Alembick or Retort set in sand or Ashes; a Copper or brass-bottom of a Stil, with a head thereto, having a pipe comming forth thereof which run's into a worm, or pipe fast'ned in a barrel or vessel filled with cold-water, and having the lower end comming forth thereof, whose figure wee shall give you when as wee com to speak of the drawing of oils out of vegetables.

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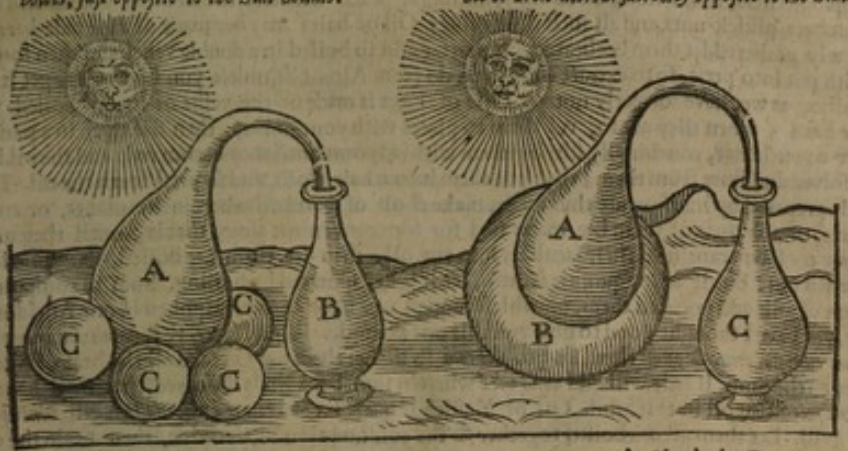
CHAP. IX.

Of the manner of rectifying, that is, how to increase the strength of waters, that have been once distilled.

TO rectifie the waters that have been distilled in *Balneo Mariæ*, you must set them in the Sun in glasses well stopped and half filled, being set in sand to the third part of their height, that the water waxing hot by the heat of the Sun may separate it self from the phlegm mixed therewith, which will bee performed in 12. or 15. daies. The first waie. There is another better waie to do this, which is to distil them again in *Balneo* with a gentle fire, or if you will put them into a Retort furnished with his receiver, and set them upon chrystal or iron-bowls, or in an iron-mortar directly opposite to the beams of the Sun, as you may learn by these ensuing signs. The second.

A Retort with his receiver standing upon Chrystal-bowls, just opposite to the Sun-beams.



A. *Shew's the Retort.*
B. *The receiver.*
C. *The Crystal bowls.*

Another Retort with his receiver standing in a Marble or Iron-mortar, directly opposite to the Sun.

A. *Shew's the Retort.*
B. *The marble, or Iron-mortar.*
C. *The receiver.*

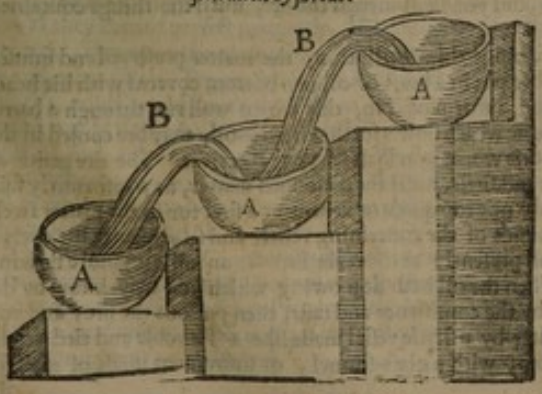
CHAP. X.

Of distillation by filtring.

YOu shall set three basins or vessels of convenient matter in that site and order that each may bee higher than other; that which stand's in the highest place, shall contein the liquor to bee distilled, and that which stand's lowest shall receiv the distilled liquor. Out of the first and second vessel shall hang shreds or pieces of cloth or cotten, with their broader ends in the liquor or upper vessel; and the other sharper ends hanging down, whereby the more subtil and defecate liquor may fall down by drops into the vessel that stand's under it, but the grosser and more feculent part may subside in the first and second vessel. You by this means may at the same time distil the same liquor divers times, if you place manie vessels one under another after the fore-mentioned manner, and so put shreds into each of them, so that the lowest vessel may receiv the purified liquor. In stead of this distillation Apothecaries oft-times use bags.

This manner of distillation was invented to make more clear and pure waters, and all juices and compositions, which are of such a liquid consistence. You may take an example from *Lac. virginis*, or Virgin's-milk, of which this is the description. *Lac Virginis.*

The description of vessels to perform the distillation or filtration by shreds.



A. *Shew's the vessel.*
B. *The Cloths or shreds.*

℞. *litharg. auri diligenter pulveri ʒ.* ʒiii. *macerentur in aceti boni* ʒvi. *trium horarum spatio, seorsim etiam in aqua plantaginis, solani, rosarum, aut communi sal infundatur*; then distil them both by shreds, then mix the distilled liquors, and you shall have that which for the milkie whiteness is termed Virgin's milk, being good against the redness and pimples of the face, as wee have noted in our Antidotarie. Cap. 44. of *hui.*

CHAP. XI.

What and how manie waies they are to make oils.

YOu may by three means especially draw to extract the oils that you desire. The first is by expression, and so are made the oils of Olives, nuts, seeds, fruits and the like. Under this is thought to bee conteined elixation, when as the beaten materials are boiled in water, that so the oil may swim aloft, and by this means are made the oils of the seeds of Elder and danewort, and of Baie-berries. Another is by infusion, as that which is by infusing the parts of plants and other things in oils. The third is by distillation, such is that which is drawn by the heat of the fire, whether by assent or by descent, or by concourse; The first waie is known by all; now it is thus, take almonds in their husks, beat them, work them into a mass, then put them into a bag made of hair, or else of strong cloth first steeped in water or in white-wine, then put them into press and so extract their oil. You may do the same in pine-apple-kernels, Hazel-nuts, Coco-nuts, nutmegs, peach-kernels, the seeds of gourds and cucumbers, pistick-nuts, and all such oilie things. Oil of baies may bee made of ripe baie-berries newly gathered, let them bee beaten in a mortar and so boiled in a double vessel, and then forthwith put into press, so to extract oil as you do from Almonds, unless you had rather get it by boiling as wee have formerly noted. Oile of Eggs is made of the yelks of Eggs boiled verie hard; when they are so, rub them to pieces with your fingers, then frie them in a pan over a gentle fire, continually stirring them with a spoon until they becom red, and the oil bee resolved and flow from them; then put them into a hair-cloth, and so press forth the oil. The oils prepared by infusion are thus made, make choise of good oil wherein let plants, or creatures, or the parts of them bee macerated for som convenient time, that is, until they may seem to have transfused their faculties into the oil, then let them bee boiled, so strained or pressed out. But if anie aquositie remain, let it bee evaporated by boiling. Som in compounding of oils add gums to them, of which though wee have formerly spoken in our Antidotarie, yet have I thought good to give you this one example. ℞. *flor. hyper.* ℞ ß. *immittantur in phialam cum flo. cent. & gum. elemi, an.* ℥ii. *olei com.* ℔ ii. Let them bee exposed all the heat of Summer to the Sun. If anie will add *aqua vitæ* wherein som Benzoin is dissolved, hee shall have a most excellent oil in this kind. Oil of Mastich is made *Ex olei rosati* ℥xii. *mastich.* ℥iii. *vini optimi* ℥viii. Let them all bee boiled together to the consumption of the wine, then strain the oil and reserv it in a vessel.

Oils by expression.

By infusion.

By distillation.

Oil of Baie-berries.

Of Eggs.

Oil of S. *John's-wort.*

CHAP. XII.

Of extracting of Oils of vegetables by Distillation.

ALmost all herbs that carrie their flowers and seeds in an umble, have seeds of of a hot, subtil and aierie substance, and consequently oilie. Now becaus the oilie substance that is conteined in simple bodies is of two kindes, therefore the manner also of extracting is twofold. For som is gross, earthie, viscous, and wholly confused and mixt with the bodies out of which they ought to bee drawn, as that which wee have said is usually extracted by expression; this becaus it most tenaciously adhere's to the grosser substance, and part of the bodie, therefore it cannot by reason of this natural grossnes, bee lifted up, or assend. Othersom are of a slender and aierie substance, which is easily severed from their bodie, wherefore beeing put to distillation it easily rise's: such is the onely substance of aromatick things, as of Juniper, Aniseeds, Cloves, Nutmegs, Cinnamom, Pepper, Ginger, and the like odoriferous and spicie things. This is the manner of extracting oils out of them; let your matter bee well beaten and infused in water to that proportion, that for everie pound of the material, there may bee ten pints of water; infuse it in a copper-bottom, having a head thereto either tinned or silvered over, and furnished with a couller filled with cold-water. Set your vessel upon a fornace having a fire in it, or else in sand, or ashes. When as the water conteined in the head shall wax hot, you must draw it forth, and put in cold, that so the spirits may the better bee condensed, and may not flie away: you shall put a long-neck't receiver to the nose of the Alembick, and you shall increas the fire, until the things contained in the Alembick boil.

What oils are to bee drawn by expression.

The first manner of drawing oils by distillation.

There is another manner of performing this distillation, the matter preserved and infused as wee have formerly declared, shall bee put in a brass or copper-bottom covered with his head, to which shall bee fitted or well luted, a worm of Tin, this worm wall run through a barrel filled with cold-water, that the liquor which flow's forth with the oil, may bee cooled in the passage forth; at the lower end of this worm you shall set your Receiver. The fire gentle at the first, shall bee increased by little and little, until the conteined matter, as wee formerly said do boil; but take heed that you make not too quick or vehement a fire, for so the matter swelling up by boiling may exceed the bounds of the conteining vessel, and so violently flie over.

Another way.

Observing these things, you shall presently at the verie first see an oilie moisture flowing forth together with the watrish. When the oil hath don owing which you may know by the color of the distilled liquor, as also by the consistence and taste, then put out the fire; and you may separate the oil from the water by a little vessel made like a Thimble and tied to the end of a stick; [or, which is better, with a glass-funnel, or instrument made of glass for

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the same purpose.] Here you must also note that there bee som oils that swim upon the top of the water; as oil of aniseeds; othersom on the contrarie, which fall to the bottom; as oil of Cinnamom, Mace, and Cloves. What oils fall to the bottom

Moreover you must note, that the watrish moisture, or water that is distilled with oil of Aniseed and Cinnamom, is whitish, and in succes of time, will in som small proportion turn into oil. Also these waters must bee kept several, for they are far more excellent then those that are distilled by *Balneum Mariæ*, especially those that first com forth together with the oil. Oils are of the same faculties with the bodies from whence they are extracted, but much more effectual; for the force which formerly was diffused in manie pounds of this, or that medicine, is after distillation contracted into a few drams. For example, the faculties that was dispersed over i. pound of Cloves, will bee contracted into two ounces of oil at the most; and that which was in a pound of Cinnamom will bee drawn into ʒiſs. or ʒii. at the most of oil. But to draw the greater quantitie with the lesser charge, and without fear of breaking the vessels, whereto glasses are subject, I like that you distil them in copper-vessels, for you need not fear that the oil which is distilled by them will contract an ill qualitie from the copper, for the watrish moisture that flow's forth together therewith will hinder it, especially if the copper shall bee tinned or silvered over. I have thought good to describe and set before your eyes, the whole manner of this operation.

A Fornace with set vessels to extract the Chymical oils, or spirits of Sage, Rosemarie, Tyme, Lavander, Aniseeds, Fennel-seeds, Cloves, Nutmegs, Cinnamom, Pepper, Ginger, and the like; as also to distil the spirit of Wine, of Vineger and Aqua vitæ. *In stead of the barrel and worm, you may use a head with a bucket or rowler about it.*

A. *Shew's the bottom, which ought to bee of Copper and tinned on the in-side.*

B. *The head.*

C. *The Barrel filled with cold water to refrigerate and condensate the water and oil that run through the pipe or worm that is put through it.*

D. *A pipe of brass or lattin, or rather a worm of Tin running through the Barrel.*

E. *The Alembick set in the fornace with the fire under it.*

Now becaus wee have made mention of Cinnamom, Pepper, and other spices which grew not here with us, I have thought good to describe these out of *Thevet's* Cosmographie, hee having seen them growing. Pepper grow's upon shrubs in *India*, these shrubs send forth little branches whereon hang clusters of berries, like to Ivie-berries, or bunches of small black grapes, of currans the leavs are like those of the Citron-tree, but sharpish and pricking. The description of Pepper.

The *Indians* gather those berries with great diligence, and stow them up in large cellars, as soon as they com to perfect maturitie. Wherefore it oft-times happen's, that there are more then 200 ships upon the coast of the lesser *Iava* an Island of that countrie, to carrie thence Pepper and other spices. Pepper is used in Antidotes against poisons, it provoke's urine, digest's, attract's, resolv's, and cure's the bites of Serpents. It is properly applied and taken inwardly against a cold stomach; in sauces it help's concoction and procure's appetite; you must make choise of such as is black, heavie, and not flaccid. The trees which bear white, and those that bear black pepper, are so like each other, that the natives themselvs know not which is which, unless when they have their fruit hanging upon them, as the like happen's upon our Vines which bear white and black grapes. The uses thereof.

The tree that yeeld's Cinnamom grow's in the mountain's of *India*, and hath leavs verie like to baie-leavs; branches and shoots at certain times of the year are cut from this tree, by the appointment of the King of that Province, the bark of which is that wee term Cinnamom. This is sold to no stranger unless at the King's pleasure and hee setting the price thereof, it is not lawful for others to cut thereof. The Cinnamom tree.

Galen

7. *ſimp.* *Galen* write's that Cinnamom is of verie ſubtil parts, hot in the third degree, and partaking of ſom aſtriction; therefore it cut's and diſſolv's the excrements of the bodie, ſtrengthen's the parts, provoke's the courſes when as they ſtop by reaſon of the admixture of groſs humors; it ſweeten's the breath, and yeeld's a fine taſte and ſmell to medicines, hippocras, and ſauces. Of Cinnamom there is made an excellent water againſt all cold diſeaſes, & alſo againſt ſwoonings, the plague and poiſons. The compoſition thereof is this. Take of the choiſeſt and beſt Cinnamom one pound, beat it groſly, and put thereto of Roſe-water four pintes, of white-wine half a pinte, beeing thus mixed, put them into a glaſs and ſo let them ſtand in infuſion 24. hours, often ſtirring of them. Then diſtil them in *Balneo Mariæ*, cloſely luting the receiver and veſſels leſt the ſpirit ſhould flie away.

An excellent Cinnamon-tree.

CHAP. XIII.

Another manner how to draw the eſſence and ſpirits of herbs, flowers, ſeeds, and ſpices; as alſo of Rubarb, Agarick, Turbith, Hermodactyls, and other Purgers.

YOu may extract the eſſences and ſpirits of the things mentioned in the title of this Chapter, as thus. Take Sugar, Rubarb, Cinnamom, or anie other material you pleaſe; cut it ſmall, or elſ beat it, then put it into a glaſs with a long neck, and pour thereupon as much *aqua vitæ* as ſhall bee ſufficient to cover the materials or ingredients, and to over-top them ſom fingers bredth, then ſtop up the glaſs verie cloſe that no air enter thereinto; Thus ſuffer it to infuſe for eight daies in *balneo* with a verie gentle heat; for thus the *aqua vitæ* will extract the faculties of the ingredients, which you ſhall know that it hath don, when as you ſhall ſee it perfectly tinctured with the color of the ingredients. The eight daies ended, you ſhall put this ſame *aqua vitæ* into another veſſel filled with the like quantitie of the ſame materials prepared after the ſame manner, that it may alſo take forth the tincture thereof, and do thus three or four times, untill the *aqua vitæ* bee deeply tinctured with the color of the infuſed Ingredients.

A ſign that the ſpirit of wine hath fetche out the ſtrength of the ingredients.

But if the materials from whence you deſire to extract this ſpirit or eſſence, bee of great price; as *Lignum Aloes*, *Rubarb*, &c. You muſt not think it ſufficient to infuſe it once onely, but you muſt go over it twice, or thrice, until all the efficacie bee exſtracted out thereof; you may know that it is all wholly inſipid.

A ſign that the ingredients have loſt their ſtrength.

Theſe things thus don, as is fitting, put all the liquor tinctured and furniſhed with the color and ſtrength of the ingredients, into an Alembick, fitted and cloſely luted to it's head, and ſo put into *Balneum Mariæ*, that ſo you may extract or draw off the *aqua vitæ*, to keep for the like purpoſe, and ſo you ſhall have the ſpirit, and eſſence remaining in the bottom.

Now if you deſire to bring this extract to the height of honie, ſet it in an earthen-pot well leaded, upon hot aſhes, ſo that the thin part thereof may bee evaporated, for thus at length, you ſhall have a moſt noble and effectual eſſence of that thing which you have diſtilled, whereof one ſcruple will bee more powerful in purging, then two or three drams of the thing its ſelf.

CHAP. XIV.

How to extract oil out of Gums, condenſed juices, and roſins, as alſo out of ſom woods.

What a Retort is.

ALL oils that are drawn out of gums, oilie-woods and metals, are extracted by that veſſel which wee vulgarly term a Retort. It muſt bee made of glaſs, or jug's-metal well leaded, and of ſuch bigneſs as ſhall bee convenient for the operation you intend, though commonly it ſhould bee made to hold ſom gallon and an half of water; the neck thereof muſt bee a foot and a half, or at leaſt a foot long. The receiver is commonly a vial whereinto the neck of the Retort is fitted and inſerted. Then the Retort ſhall bee ſet in an earthen pan filled with aſhes, or ſand, and ſo ſet into a furnace, as you may ſee by the following figure.

The figure of a Furnace, with his earthen-pan and receiver.

A. *Shew's the furnace.*

B. *The earthen-pan, or veſſel to ſet the Retort in.*

C. *The Retort or Cucurbite.*

D. *The Receiver.*

Of

Of gums, som are liquid, som solid; and of the solid, som are more solid then othersom; those that are solid are more troublesom to distil then the liquid, for they are not so easily dissolved or melted, neither do they yeeld so well to the fire, so that oft-times they are burnt before they bee dissolved; whence it is that som for everie pound of solid gum add two or three pounds of most clear and liquid oil of Turpentine. Besides, liquid things are also hard to bee distilled, becaus when as they com to bee throughly hot at the fire, they swell up so much, that they exceed, or run out of the Retort, and so fall into the Receiver, as they were put into the Retort, especially if so bee that the fire bee too hot at the first. Manie to shun this inconvenience add to the things put into the Retort, som sand, as it were, to balast it withal.

The differences of Gums.

Cautions in distilling of Gums.

Oil of Rosin and Turpentine is thus made; take two or three pounds of Turpentine, and put it into a Retort of such largeness that three parts thereof might remain emptie, and for everie pound of Turpentine add three or four ounces of sand; then place the Retort in an earthen-pan, filled with sifted ashes, and set it upon the fornace as is fit, and to the neck thereof fit and closely lute a Receiver. Lastly, kindle there-under a soft fire at the first, lest the conteined materials should run over; increas this fire by little and little, and take heed that the things becom not too hot on a sudden. At the first, a clear and acid liquor will drop out, wherein a certain sediment use's to concrete; then will flow forth a most clear oil, somwhat resembling the watrie and phlegmatick liquor; then must the fire bee somwhat increased, that the third oilie, clear, thin and verie golden colored liquor may rise and distil; but then also a clearer and more violent fire must bee raised, that so you may extract an oil that will bee red like a carbuncle, and of a consistence indifferently thick. Thus therefore you may extract four kindes of liquors our of Turpentine, and receiv them beeing different in several Receivers; yet I judg it better to receiv them all in one, that so by distilling them again afterwards you may separate your desired oil; now there will ten or twelv ounces of oil flow from an ounce of Turpentine. This kinde of oil is effectual against the Palsie, Convulsions, punctures of the nervs, and wounds of all the nervous parts.

How to make oil of Turpentine.

But you shall thus extract oil out of wax; Take one pound of wax, melt it, and put it into a glass-Retort set in sand, or ashes, as wee mentioned a little before in drawing of oil of Turpentine, then distil it, by increasing the fire by degrees. There distil's nothing forth of wax, besides an oilie substance and a little *Phlegma*, yet portion of this oilie substance presently concrete's into a certain butter-like matter, which therefore would bee distilled over again; you may draw ℥vi. or viii. of oil, from one pound of wax.

How to make oil of wax.

This oil is effectual against Contusions, and also verie good against cold affects.

The faculties thereof.

CHAP. XV.

Of extracting of Oils out of the harder sorts of Gums; as myrrh, mastich, Frankincens, and the like.

SOm there bee who extract these kindes of oils with the Retort set in ashes or sand, as wee mentioned in the former Chapter of Oils of more liquid Gums, adding for everie pound of Gum two pintes of *Aqua vitæ*, and two or three ounces of Oil of Turpentine, then let them infuse for eight or ten daies in *Balneo mariæ*, or elf in horse-dung; then set it to distil in a Retort. Now this is the true manner of making of Oils of Myrrh; Take Myrrh made into fine powder, and therewith fill hard Eggs in stead of their yelks beeing taken out; then place the Eggs upon a gridiron, or such like grate in som moist place as a cellar, and set under them a leaden-earthen-pan; the Myrrh will dissolv into an oilie-water, which beeing presently put into a glass and well stopped, with an equal quantitie of rectified *Aqua vitæ*, and so set for three or four months in hot horse-dung, which past the vessel shall bee taken forth, and so stopped that the conteined liquor may bee poured into an Alembick, for there will certain gross settling by this means remain in the bottom, then set your Alembick in *Balneo* and so draw off the *Aqua vitæ* and phlegmatick liquor, and there will remain in the bottom a pure and clear oil, whereto you may give a curious color by mixing therewith som Alkanet, and a smell by dropping thereinto a little oil of Sage, Cinnamom, or Cloves.

How to make oil of myrrh.

How to give it a pleasing color and smell.

Now let us shew the composition and manner of making of balsams by giving you one or two examples; the first of which is taken out of *Vesalius* his Surgerie; and is this.

℞. *terebinth. opt.* ℔ i. *ol. laurini* ℥iiii. *gum. elem.* ℥iiiiß. *thuris, myrrhæ, gum. heredæ, centaur. majoris, ligni aloës, an.* ℥iii. *galangæ, caryophyll. consolidæ majoris, Cinnamomi, nucis moschat. zedoariæ, zinzib. dictamni albi, an.* ℥i. *olei vermium terrestrium,* ℥ii. *aquæ vitæ* ℔vi.

Vesalius his Balsam.

The manner of making it is this; Let all these things bee beaten and made small, and so infused for three daies space in *Aqua vitæ*, then distilled in a Retort just as wee said, you must distil oil of Turpentine and Wax. There will flow hence three sorts of liquors; the first watrish and clear, the other thin, and of pure golden color: the third of the color of a Carbuncle, which is the true Balsam. The first liquor is effectual against the weakness of the stomach comming of a cold cause, for that it cut's phlegm and discusse's flatulencies; the second help's fresh and hot bleeding wounds, as also the palsie. The third is chiefly effectual against these same effects. The composition of the following *Balsamum* is out of *Fallopius*; and is this. ℞. *terebinth. claræ*, ℔ ii. *olei de semine lini* ℔ i. *resinæ pini*, ℥vii. *thuris, myrrhæ, aloës, mastiches,*

Fallopius his Balsam.

mastiches, sarcocollæ, an. ℥iii. *macis, ligni Aloës, an.* ℥ii. *croci,* ℥ß. Let them all bee put into a glass-Retort, set in ashes and so distilled. First there will com forth a clear water, then presenly after a reddish oil, most profitable for wounds.

Now you must know that by this means, wee may easily distil all Axungia's, fats, parts of creatures, woods, all kindes of barks and seeds, if so bee that they bee first macerated as they ought to bee, yet so that there will com forth more watrie then oilie humiditie. Now for that wee formerly frequently mentioned *Thus* or Frankincens, I have here thought good out of *Thevet's* Cosmographie to give you the description of the tree from which it flow's. The Frankincens-tree (saith hee) grow's naturally in *Arabia*, resemble's a Pine, yeelding a moisture that is presently hardened, and it concrete's into whitish clear grains, fattie within, which cast into the fire, take flame. Now Frankincens is adulerated with Pine-rosin and Gum, which is the caus that you shall seldom finde that with us, as it is here described; you may finde out the deceit as thus, for that neither Rosin nor anie other Gum take's flame, for Rosin go's away in smoak, but Frankincens presently burn's. The smell also bewraie's the counterfeit, for it yeeld's no grateful smell as Frankincens doth. The *Arabians* wound the tree that so the liquor may the more readily flow forth, whereof they make great gain. It fill's up hollow ulcers and cicatrize's them; wherefore it enter's as a chief ingredient into artificial balsam; Frankincens alone made into powder and applied, stanche's the blood that flow's out of the wounds.

What Frankincens is.

The faculties thereof.

Matthiolus saith, that it beeing mixed with Fuller's-earth, and oil of Roses, is a singular remedie against the inflammation of the breasts of women lately delivered of childe.

CHAP. XVI.

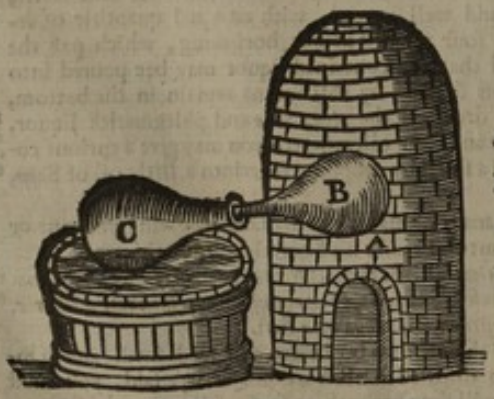
The making of oil of Vitriol.

TAke ten pounds of Vitriol, which beeing made into powder, put it into an earthen-pot, and set it upon hot coals, untill it bee calcined, which is when as it becom reddish; after som five or six hours, when as it shall bee throughly cold, break the pot, and let the Vitriol bee again made into powder, that so it may bee calcined again, and you shall do thus so often and long until it shall bee perfectly calcined, which is when as it shall bee exactly red; then let it bee made into powder, and put into an earthen-Retort, like that wherein *aqua fortis* is usually drawn, adding for everie pound of your calcined Vitriol of tile-shreds, or powdered-brick 1 quarter; then put the Retort furnished with it's receiver into a Fornace of Reverberation, alwaies keeping a strong fire, and that for the space of 48. hours, more or less according to the manner and plentie of the distilling liquor. You shall know the distillation is finished when as the Receiver shall begin to recover his native perspicuitie, beeing not now filled with vaporous spirits, wherewith as long as the humor distil's it is replenished and look's white.

The sign of perfectly calcined vitriol.

Now for the Receiver there are two things to bee observed. The first is, that it bee great and verie capacious, that it may not bee distended and broken by the abundant flowing of vaporous spirits, as it doth oft-times happen; another thing is, that you set it in a vessel filled with cold water, lest it should bee broken by beeing over hot; you may easily perceiv all this by the ensuing figure.

A Fornace or Reverberation furnished with his Retort and Receiver.



A. *Shew's the Fornace.*

B. *The Retort.*

C. *The Receiver.*

D. *The vessel filled with cold water.*

CHAP.

CHAP. XVII.

A Table or Catalogue of Medicines and Instruments serving for the cure of Diseases.

MEdicines, and Medicinal meats fit for the cure of Diseases, are taken from living Creatures, Plants and Minerals. From living creatures are taken,

Horns. Hoovs. Hairs. Feathers. Shells. Sculls. Scales. Sweats. Skins. Fats. Flesh. Blood. Entrails. Urine. Bones. Extreme parts. Hearts. Liver. Lungs. Brain. Womb. Secundine. Testicles Pizzle. Bladder Sperm. Tail. Coats of the Ventricle. Exspirations. Bristles. Silk. Webs. Tears. Spittle. Honie. Wax. Eggs. Milk. Butter. Cheese. Marrow. Rennet.

Smells whether they bee stinking or sweet, as also Poisons: whole creatures themselvs: as,

Foxes. Whelps. Hedg-hogs. Frogs. Worms. Crabs Craie-fishes. Scorpions. Horsleeches. Swallows. Dungs.

From Plants, that is, Trees, Shrubs, and Herbs, are taken

Roots. Moss. Pith. Sions. Buds. Stalks. Leavs. Flowers. Cups. Fibers, or hairie-thredes. Ears. Seeds. Bark. Wood. Meal. Juices. Tears. Oils. Gums. Rosins. Rottennesse. Mass or spissament. Manna, *which falling down like dew upon plants, presently concrete's. Whole plants, as Mallows. Onions, &c.*

Metals, or Minerals, are taken either from the Water, or Earth, and are either kindes of Earth, Stones, or Metals, &c. The kindes of Earth are,

Bole-Armenick. Terra sigillata. *Fuller's-earth. Chaulk. Okar. Plaster. Lime.*

Now the kindes of Stones are

Flints. Lapis Judaicus. Lapis Lyncis. *The Pumice.* Lap. Hæmatites. Amiantus. Galactites. *Spunge-stones. Diamonds. Sapbire. Chrysolite. Topace. Load-stone.* The Pyrites *or fire-stone. Alablaster. Marble. Crystal, and manie other pretious stones.*

The kindes of Salts as well Natural as Artificial are

Common salt Sal nitrum. Sal Alkali. Sal Ammoniacum. *Salt of Urine. Salt of tartar and generally all salts that may bee made of anie kinde of Plants.*

Those that are commonly called Minerals are

Marchasite. Antimonie. Muscovie-Glass, Tuttie. Arsnick. Orpiment. Lazure, or blue. Rose-agar. Brimstone. Quick-silver. White-Copras. Chalcitis. *Psorie. Roman Vitriol.* Colcother, *vitriol, or green coperas.* Alumen scissile, *Common Alum.* Alumen rotundum. *Round Alum.* Alumen liquidum. Alumen plumosum. Borax, *or Burrace.* Bitumen, Naphtha. Cinnabaris, *or Vermillion. Lytharge of Gold. Lytharge of Silver.* Chrysocolla. Scandaracha. *Red-lead. White-Lead, and divers other.*

Now the Metals themselvs are

Gold, Silver, Iron, Lead, Tin, Brass, Copper, Steel, Lattin and such as arise from these; as the scales, verdigreas, rust, &c.

Now from the Waters; as the Sea, Rivers, Lakes and Fountains, and the mud of these waters, are taken divers medicines, as white and red Corral, Pearls, and infinite other things which Nature the hand-maid of the great Architect of this world, hath produced for the cure of diseases; so that into what part soever you turn your eies, whether to the surface of the earth, or the bowels thereof, a great multitude of remedies present themselvs to your view. The choise of all which is taken from their substance, or quantitie, qualitie, action, place, season, smell, taste, site, figure, and weight, other circumstances, as *Sylvius* hath abundantly shewed in his Book written upon this Subjects. Of these Simples are made diverse Compositions; as,

Collyria. Caputpurgia. Eclegmata. *Dentifrices.* Dentiscalpia. Apophlegmatismi. *Gargarisms. Pills. Boles. Potions. Emplasters. Unguents. Cerats. Liniments. Embrocations. Fomentations. Epithemes. Attractives. Resolvers. Suppuratives. Emollients. Mundificatives. Incarnatives. Cicatrizers. Putrifiers. Corrosives. Agglutinatives. Anodynes. Apozemes. Julips. Syrups. Powders. Tablets. Opiats. Conserves. Preserves. Confections. Rowls. Vomits. Sternutatories. Sudorificks. Glysters. Pessaries. Suppositories. Fumigations. Trochisces. Frontrals. Caps. Stomachers. Bags. Baths. Half-baths. Virgins-milk.* Fuci. *Pications. Depilatories. Vesicatories. Potential cauteries. Nose-gaies. Fans. Canopies, or extended cloths to make winde. Artificial fountains, to distil or drop down liquors.*

Now these that are thought to bee nourishing Medicines, are,

Restauratives. Cullisses. Expressions. Gellies. Ptisans. Barlie-creams. Panadoes. Almond-milks. marchpains. Wafers. Hydrosaccbar. Hydromel, *and such other drinks. Mucilages.* Oxymel. *Oxycrate. Rose-Vineger.* Hydrælium. *Metheglin. Cider. Drink of Servisses, Ale. Beer. Vineger. Verjuice. Oil. Steeled-water. Water brewed with bread-crums. Hippocras, Perrie, and such like.*

Waters and distilled oils, and divers other Chymical extractions.

As the waters and oils of hot, drie and aromatick things, drawn in a copper-Alembick, with a cooler, with ten times as much water in weight as of herbs; now the herbs must bee drie, that the distillation may the better succeed.

Waters are extracted out of flowers put into a Retort, by the heat of the Sun, or of Dung, or of an heap of pressed-out Grapes, or by *Balneo*, if there bee a Receiver put and closely luted thereto. All kindes of salt of things calcined, dissolved in water, and twice or thrice filtred, that so they may becom more pure and fit to yeeld oil.

Other distillations are made either in Cellars by the coldnesse or moisture of the place, the things beeing laid either upon a marble, or elsse hanged up in a bag; and thus is made oil of Tartar, and of salts, and other things of an Aluminous nature.

Bones must bee distilled by descent, or by the joining together of vessels. All woods, roots, barks,

barks, ſhells of fiſhes, and ſeed, or grains; as of corn, broom, beans, and other things whoſe juice cannot bee got out by expreſſion, muſt bee diſtilled by deſcent, or by the joining together of veſſels in a Reverberatorie Fornace.

Metals calcined and having acquired the nature of ſalt, ought to bee diſſolved and filtred, and then evaporated till they bee drie; then let them bee diſſolved in diſtilled vineger, and then evaporated and dried again; for ſo they will eaſily diſtil in a Cellar upon a Marble, or in a bag. Or elſ by putting them into a glaſſie Retort, and ſetting it in ſand, and ſo giving fire thereto by degrees until all the waterie humiditie bee diſtilled; then change the receiver, and lute another cloſe to the Retort, then increaſ the fire above and below, and thus there will flow forth an oil verie red colored: Thus are all metalline things diſtilled, as Alums, ſalts, &c.

Gums, *axungie*, and generally all roſins are diſtilled by Retort ſet in an earthen veſſel filled with Aſhes upon a Fornace; now the fire muſt bee increaſed by little and little according to the different condition of the diſtilled matters.

The Veſſels and Inſtruments ſerving for Diſtillations are commonly theſe.

Bottoms of Alembicks. The heads of them, from whence the liquors drop. Refrigeratories. Veſſels for ſublimation. For Reverberation. For diſtilling by deſcent. Crucibiles and other ſuch. Veſſels for Calcination. Hair-ſtrainers. Bags. Earthen-platters. Veſſels for circulation, as Pelicanes. Earthen-Baſins for filtring. Fornaces. The ſecret Fornaces of Philoſophers. The Philoſopher's egg. Cucurbites. Retorts. Bolt-heads. Urinals. Receivers. Veſſels ſo fittted together that the lowermoſt receiv's the mouth of the uppermoſt, whence they may bee termed conjoined Veſſels: They are uſed in diſtilling *per deſcenſum*. Marbs exquiſitely ſmooth for diſtillations to bee made in Cellars. Pots to diſſolv calcined metalls in.

A Catalogue of the Surgeon's Inſtruments mentioned in this whole work.

Rings wherein little Lancets lie hid, to open Impoſtumes. Trunks or hollow Inſtruſtruments going with ſprings. A vent, or cooler for the womb made like a peſſarie. Hollow tents. Sundrie Cauteries; as flat, round, ſharp-pointed, cutting, &c. Conſtrictorie rings to twitch or binde the Columella. *Speculum Oris. Ocul. Ani. Uteri.* A trunk or pipe with an actual Cauterie in it. Crooked Knives. A pipe in form of a quill. Divers truſſes, with one or more boulſters. A ſhoulder-band to bee put about the neck, to hold up a truſs. A needle to draw through a golden wier, &c. Pipes with feneſtels, and needls fit for ſutures. Cutting mullets. Mullets onely to hold and not to cut. Mullets to take forth ſplinters of bones. Mullets to draw teeth. An inciſion-knife. Scrapers to plain or ſmooth the bones, or elſ to cut them. Cutting or hollow Scrapers. A leaden mallet to drive the Scrapers or Chizzels into the ſcull. A Gimblet in ſhape and uſe reſembling that which Coopers uſe to lift up the ſunk ſtaves of their cask withal. Levatories, of which kinde is the three-footed one. Old Levatories, which taken by their handls, and their tongues put under the depreſt bones, lift them up. Saws. A deſquamatorie Trepan. Pliers to take forth ſplinters of bones. A Gimblet to perforate the ſcull. A Trepan fit to divide the ſcull, with the ſcrue, point, or piercer, brace, and cover or cap that keep's it from running in too far. A plate to ſet one foot of the Compaſs upon. A cutting pair of Compaſſes both open and ſhut. A fit inſtrument to depreſs the *Dura mater* without hurting thereof. A ſyringe to make injection withal. A pair of Pincers with holes through them to take up the skin for making a Seton. Setons as well drie, as moiſtned with ointments. The Beaks of Crows, Parrats, Swans, Ducks, Lizards, Cranes, are either ſtraight, crooked, toothed, or ſmooth. Catch-bullets, and Pliers to draw forth pieces of mail, and ſplinters of bones that lie deep in. Hollow and ſmooth Dilaters diverſly made for the different wounds of the parts. Probes fit for to put flamula's into wounds; and theſe are either ſtraight or crooked. perforated or unperforated. Scrued mullets to draw forth barbed heads of arrows, and the like. Lancets to let blood, and ſcarrifie as well ſtraight, as crooked. A *pyulcos*, or Matter-drawer. Ligatures, bands, ſwathes, thongs of leather, woollen, linnen, round, ſlit, ſown together; again ſom are upper-binders, others under-binders. Again theſe are either expreſſing, or elſ conteining, and that either the applied medicine, or the lips of wounds, or members put in a fit poſture, which therefore they call a ſarcotick Ligature. Thred. Bottoms, or clews of thred, or yarn. Pledgets, compreſſes, boulſters, doubled cloaths. *Ferulæ*, or Splints. Caſſes. Boxes. Junks. Gloſſocomies. *Ambi*, a kinde of Gloſſocomie. A pullie with it's wheels, and wooden and iron-pins, whereon the wheels may run. Ropes as well to draw & extend, as hold up the member, &c. Scrue-pins. A hand-vice. Hooks. Buttons or ſtaies to faſten to the skin to hold together the lips of the wounds. Lint. Cuſhions, pillows, linnen-cloths. Files. *Dentiſcalpia, Dentifricia, Dentiſpiſcia.* Catheters, guiders of the work. A bathing chair or ſeat, bathing-tubs, half-tubs, caldrons, funnels, with all other circumſtances belonging to a bath. Stoves, or hot-houſes to ſweat in. Cocks to turn and let out water. A Gimblet to break the ſtone. Hooks. Hollow probes ſlit on the upper-ſides. Winged Inſtruments to draw forth ſtones. An inſtrument to cleanſ the bladder. Spathula's ſtraight and crooked. Cupping-glaſſes. Horns. Pipes or catheters to wear Caruncles. Artificial members, as eies of gold enamelled, &c. An Urinal, or caſe to ſave the water in. An artificial yard. Crutches. Nipples, or leaden covers for ſore breaſts. Griffins talons to draw forth a *mola*, out of the womb. A ſucking-glaſs to draw a breaſt withal. Peſſaries, both long and oval. Syringes to give glyſters, as alſo to make injection into the ears and womb.

The

The Effigies of Hippocrates of *Coos* the Prince of Physicians.

INvictum (*Hippocrates*) quòd te potuere superbæ
Eoî nunquam flectere Regis opes,
Cecropidæ fronti ex auro fulgente coronam
Promeriti memores imposuere tuæ.
Gratia sed levis est, Actæis tantus Athenis
Nec fuit hinc uni quàm tibi partus honos.
Nam quòd quæ recreent languentia corpora mor
Pæonias fueris promere largus opes.
Sed tua tam fundit, quàm magni machina mundi
Gratia, & insignis tam tua fama volat.

Bon. Gra. Paris, Medic.

Select Aphorisms concerning Surgerie, collected out of the Aphorisms of the great Hippocrates,

Aphor. 27. sect. 6.

WHosoever beeing suppurate or hydropical, are burnt, or cut therefore, if all the matter, or water flow forth at once, they certainly die.

31. 6. The drinking of wine, or a bath, fomentation, blood-letting, or purging, help the pains of the eies.

38. 6. Such as have hidden, or not ulcerated Cancers, had better not to cure them. For healed they quickly die, not cured they live the longer.

55. 6. Gootie-pains usually stir in the Spring and Fall.

28. 6. Eunuchs are not troubled with the Gout, neither do they becom bald.

49. 6. Whosoever are troubled with the Gout, have eas in fortie daies, the inflammation ceasing.

66. 5. In great and dangerous wounds, if no swelling appear, it is ill.

67. 5. Soft tumors are good, but crude ones ill.

25. 6. For an *Erysipelas*, or inflammation to return from without inwards, it is not good; but to com from within outwards, is verie good.

19. 7. An *Erysipelas* comming upon the baring of a bone, is evil.

20. 7. Putrefaction, or suppuration comming upon an *Erysipelas*, is ill.

21. 6. If *Varices* or Hæmorrhoides happen to such as are mad, their madnes cease's.

21. 7. A flux of blood ensuing upon a great pulsation in ulcers is ill.

26. 2. It is better that a fever happen upon a convulsion, then a convulsion upon a fever.

4. 6. Those Ulcers that have the skin smooth or shining about them, are evil.

18. 6. The wound is deadlie whereby the bladder, brain, heart, midriff, anie of the small guts, stomach, or Liver are hurt.

45. 6. Whatsoever ulcers are of a year's continuance or more, the bone must necessarily scale, and the scars becom hollow.

2. 7. The bone beeing affected, if the flesh bee livid, it is ill.

14. 7. Stupiditie and lack of reason, upon a blow of the head, is evil.

24. 7. A *Delirium* happen's if a bone (to wit, the scull) bee cut even to the hollowness thereof.

Whil'st *Pus*, or matter is in generating, pains and fevers happen rather then when it is alreadie made.

18. 5. Cold things are hurtful to the bones, teeth, nervs, brain, spinal marrow, but hot things are good.

46. 2. Two pains infesting together, but not the same place, the more vehement obscure's the other.

74. 7. A corruption an abscess of the bone is caussed by the corruption of the flesh.

506. *Coacar. prænot.* A livid or drie ulcer, or yellowish, is deadlie.

19. 6. When as a bone, or gristle, or nerv, or small portion of the cheek, or the prepuce is cut asunder, it neither increase's, nor grow's together.

24. 6. *Aph. &* 513. *Coacar.* If anie of the small guts bee cut, it knit's not again.

50. 7. Those that have the brain sphacelate, that is, corrupt, they die within three daies; if they escape these, they recover.

9. 7. Bleeding at a wound caussing a convulsion, is the fore-teller of death.

20. 5. Cold is biting to ulcers; harden's the skin, causse's pain, not easily comming to suppuration, blackness, aguish shakings, convulsions, cramps.

508. *Coac.* Those who have the temples cut, have a convulsion upon the parts contrarie to the section.

44. 7. Whosoever beeing suppurate are burnt or cut, if pure and white quitture shall flow forth they escape; but if that which is bloodie, feculent, and stinking, then they die.

Galen. Comment. ad Aphor. 29. 2. It is not fit to take in hand to cure such as are in a desperate case, but to leav them, one fore-telling the end of the disease.

Celsus, Cap. 10. *Lib.* 2. It is better to trie a doubtful remedie then none at all.

The

The Effigies of Galen the Prince of Physicians next to Hippocrates.

*Æ*Quum *erat Hippocratem divino è semine Divûm,*
Orbem muneribus conciliare sibi:
Scripta sed involvit tam multo ænigmate, verum
Ut quamvis solers nullus habere queat;
Pergamei auxilio nisi sint monimenta Galeni,
Qui doctâ ambages sustulit arte senis.
Ergò macte esto virtute, arcana resolvens,
Quæ nulli fuerant nota (Galene) priûs;
Obstringénsque orbem æterno tibi munere totum,
Æternis sacras te quoque temporibus.

Bon. Gra. Paris. Medic.

Rules of Surgerie by the Autor.

1 PRactice is an operation agreeable to the Rules and Laws of the Theorie.

2 Health is not received by Words, but by Remedies fitly used.

3 Remedies known and approoved by use and reason, are to bee preferred before such as are unknown, or but lately found out.

4 Science without experience get's the Physician no great credit with the Patient.

5 Hee that would perform anie great and notable work, must diligently applie himself to the knowledg of his subject.

6 It is the part of a good Physician to heal the diseas, or certainly to bring it to a better pass, as nature shall give leav.

7 The Surgeon must bee active, industrious, and well-handed, and not trust too much to Books.

8 Hee that hath not been versed in the operations of the Art, nor a frequent auditor of the Lectures of such as are learned therein, and set's forth himself for a brave Surgeon, for that hee hath read much, hee is either much deceived or impudent.

9 Hee shall never do anie thing praise-worthie, that hath got his masterie in Surgerie by gold, not by use.

10 You shall comfort the Patient with hope of Recoverie, even when as there is danger of death.

11 To change Physicians and Surgeons is troublesom, but not good for the Patient.

12 Though the diseas proov long, yet it is not fit that the Physicians give over the patient

13 Great wounds of large vessels are to bee judged deadlie.

14 Everie contusion must bee brought to suppuration.

15 As the nature or kinde of the diseas must bee known, so also must the remedie.

16 An Abscess of the bone of the palat, is in danger to caus a stinking-breath.

87 Bleeding caussed by heat must bee represt by cold.

18 Wounds of nervous parts require medicines which by the subtiltie of the parts may enter in and draw from far.

19 It is not fit for such as have Ulcers in their Legs, neither to walk, stand nor sit, but to rest themselvs in bed.

20 All biting and acrid medicines are offensive to clean Ulcers.

21 For restoring of dislocations you must hold them fast, stretch them out, and force them in.

22 A great Gangrene admit's no cure, but cutting.

23 A monster is a thing dissenting from the laws of nature.

24 Wounds of the Chest presently becom sanious and purulent.

25 The wounds made by all venemous creatures are dangerous.

26 The south-winde blowing, wounded members easily becom mortified.

27 Such as are wounded, and desire to bee quickly whole, must keep a spare diet.

28 Untemperate bodies do not easily recover of diseases.

29 Round Ulcers, unless they bee drawn into another figure, do not easily heal up.

30 An Erysipelatous Ulcer require's purgation by stool.

31 Crying is good for an infant, for it serv's in stead of exercise and evacuation.

32 Grief is good for none but such as are verie fat.

33 Idleness weaken's and exstinguisheth the native heat.

24. An ill-natured Ulcer yeeld's not unless to a powerful remedie.

35 A bath resolv's and discusses humors, and gently procure's sweat.

36 Cold diseases are troublesom to old people, and hard to bee helped; but in young bodies they are neither so troublesom, nor contumacious.

37 Exercised bodies are less subject to diseases

38 Moist bodies though they need small nourishment, yet stand they in need of large evacuation.

39 Sick people die sooner of an hot distemper then of a cold, by reason of the quick and active operation of fire.

40 The quitture that flow's from an ulcer is laudable, which is white, smooth and equal.

The end of the twentie seventh Book.

How to make Reports, and to Embalm the Dead.

The Twentie eighth Book.

NOw it onely remain's that wee inſtruct the Surgeon in making and framing his Report, or opinion, either of the death of anie perſon, or of the weakneſs, or depriuation of anie member in the function or execution of its proper office and dutie. Herein it is meet that hee bee verie conſiderate that is to ſaie, ingenious or wiſe in making his Report, becauſ the events of diſeaſes are often-times doubtful and uncertain, neither can anie man fore-tel them certainly, whether they will bee for life or death, by reaſon of the manifold nature of the ſubject of which wee ſpeak, and alſo the uncertain condition of the humors both in their kinde and motion. Which was the cauſ why *Hippocrates* even in the firſt of his Aphoriſms pronounceth, that judgment is difficult. But firſt of all, it is verie expedient that a Surgeon bee of an honeſt minde, that hee may alwaies have before his eies a careful regard of true pietie; that is to ſaie, the fear of God and faith in Chriſt, and love toward his neighbors, with hope of life everlaſting, leſt that hee beeing carried away by favor, or corrupted with monie or rewards, ſhould affirm or teſtifie thoſe wounds to bee ſmall that are great, and thoſe great that are ſmall; for the report of the wound is received of the Surgeon according to the Civil Law.

Why a Surgeon muſt bee careful in making of Reports.

What judgment is difficult.

It is recorded in the works of antient Phyſicians that wounds may bee called great for three reſpects.

Wounds termed great for three reſpects.

The firſt is by reaſon of the greatneſs of the diſſolved Unitie or reſolution of Continuitie; and ſuch are theſe wounds which made by a violent ſtroke with a back-ſword have cut off the arm, or leg, or overthwart the breaſt. The ſecond is by reaſon of the dignitie or worthineſs of the part; now this dignitie dependeth on the excellencie of the action; therefore thus anie little wound made with a bodkin, knife, in anie part whoſe ſubſtance is noble: as in Brain, Heart, Liver or anie other part whoſe action and function is neceſſarie to preſerv life, as in the Weaſant, Lungs, or Bladder, is judged great. The third is, by reaſon of the greatneſs and ill habit, or the abundance of ill humors or debilitie of all the wounded bodie; ſo thoſe wounds that are made in the nervous parts, and old decaied people, are ſaid to bee great. But in ſearching of wounds let the Surgeon take heed that hee bee not deceived by his probe. For manie times it cannot go into the bottom of the wound but ſtoppeth, and ſticketh in the waie, either becauſ hee hath not placed the patient in the ſame poſture, wherein hee was when hee received his hurt; or elſ for that the ſtroke beeing made down right, ſlipt aſide to the right or left hand, or elſ from below upwards, or from above downwards, and then hee may exſpect that the wound is but little and will bee cured in a ſhort time, when it is like to bee long in curing, or elſ mortal. Therefore from the firſt daie it behooveth him to ſuſpend his judgment of the wound until the ninth, for in time the accidents will ſhew themſelvs manifeſtly, whether they bee ſmall or great, according to the condition of the wound, or wounded bodies, and the ſtate of the air according to his primitive qualities, or venemous corruption.

How long a Surgeon muſt ſuſpend his judgment in ſom caſes.

But generally the ſigns, whereby wee may judg of diſeaſes, whether they bee great or ſmall, of long or ſhort continuance, mortal or not mortal, are four. For they are drawn either from the nature and eſſence of the diſeaſ, or from the cauſ or effects thereof, or elſ from the ſimilitude, proportion, and compariſon of thoſe diſeaſes with the ſeaſon or preſent conſtitution of the times. Therefore if wee are called to the cure of a green wound, whoſe nature and danger is no other but a ſimple ſolution of Continuitie in the muſculous fleſh, wee may preſently pronounce that wound to bee of no danger, and that it will ſoon bee cured. But if it have an Ulcer annexed unto it, that is, if it bee ſanious, then wee may ſaie it will bee more difficult and long in curing; and ſo wee may pronounce of all diſeaſes, taking a ſign of their eſſence and nature. But of the ſigns that are taken of the cauſſes, let this bee an example. A wound that is made with a ſharp-pointed and heavie weapon; as with an halberd beeing ſtricken with great violence muſt bee accounted great, yea and alſo mortal, if the accidents bee correſpondent.

General ſigns whereas by wee judg of diſeaſes.

But if the patient fall to the ground through the violence of the ſtroke, if a cholerick vomiting follow thereon, if his ſight fail him, together with a giddineſs, if blood com for at his eies and noſtrils, if diſtraction follow with loſs of memorie and ſenſ of feeling: wee may ſaie, that all the hope of life remaineth in one ſmall ſign which is to bee deduced from the effects of the wound. But by the comparing it unto the ſeaſon that then is, and diſeaſes that then aſſault man's bodie, wee may ſaie, that all thoſe that are wounded with gun-ſhot are in danger of death, as it happened in the skirmiſhes at the ſiege of *Roan*, and at the battel of Saint *Denis*. For at that time, whether it were by reaſon of the fault of the heavens, or air, through

Wounds dead-lie by the fault of the air.

the evil humors of man's bodie, and the disturbance of them; all wounds that were made by gun-shot, were for the most part mortal. So likewise at certain seasons of the year, wee see the small-pocks and meazels break forth in children, as it were by a certain pestilent contagion to the destruction of children onely, inferring a most cruel vomit and lask; and in such a season the judgment of those diseases is not difficult. But you by the following signs may know what parts are wounded. If the patient fall down with the stroke, if hee lie senseless, as it were asleep, if hee avoid his excrements unwittingly, if hee bee taken with giddiness, if blood com out at his ears, mouth, and nose, and if hee vomit choler, you may understand that the scull is fractured, or pierced through, by the defect in his understanding and discourse. You also may know when the scull is fractured, by the judgment of your external senses, as if by feeling it with your finger you finde it elevated or depressed beyond the natural limits, if by striking it with the end of a probe, when the *Pericranium* or nervous film that investeth the scull is cut cross-wise; and so divided there from it, yeeld a base and unperfect sound like unto a pot-sheard that is broken, or rather like unto an earthen-pitcher that hath a cleft, or rent therein.

Signs of a fractured scull.

Signs of death by a wound on the head.

But wee may say, that death is at hand if his reason and understanding fail him, if hee bee speechless, if his sight forsake him, if hee would tumble head-long out of his bed, beeing not at all able to remoov the other parts of his bodie; if hee have a continual fever, if his tongue bee black with driness, if the edges of the wound bee black or drie, and cast forth no sanious matter, if they resemble the color of salted-flesh, if hee have an apoplexie, phrensie, convulsion or palsie, with an involuntarie excretion, or absolute suppression of the urine and excrements. You may know that a man hath his throat, that is, his weason and winde-pipe cut. First by the sight of his wound, and next by the abolishment of the function or office thereof both waies, for the patient can neither speak nor swallow anie meat or drink; and the parts that are cut asunder, divide themselvs by retraction upwards or downwards one from another, whereof commeth sudden or present death. You may know that a wound hath pierced into the breast or concavitie of the bodie, if the air com forth at the wound making a certain whizzing noise, if the patient breathe with great difficultie, if hee feel a great heavines or weight on or about the midriff, whereby it may bee gathered, that a great quantitie of blood lieth on the place or midriff, and so causeth him to feel a weight or heavines, which by little and little, will bee cast up by vomiting. But a little after a fever commeth, and the breath is unsavorie, and stinking, by reason that the putrifying blood is turned into *sanies*: the patient cannot lie but on his back, and hee hath an often desire to vomit, but if hee escape death, his wound will degenerate into a Fistula, and at length will consume him by little and little.

Signs that the throat is cut.

Signs that a wound hath pierced in the contavitie of the chest.

Signs that the Lungs are wounded.

That the Heart is wounded.

Wee may know that the Lungs are wounded by the foaming and spumous blood comming out both at the wound and cast up by vomiting; hee is vexed with a grievous shortnes of breath and with a pain in his sides. Wee may perceiv the Heart to bee wounded by the abundance of blood that commeth out at the wound, by the trembling of all the whole bodie, by the faint and small pulse, paleness of the face, cold sweat, with often swooning, coldness of the extreme parts, and sudden death.

The Midriff.

When the midriff (which the Latines call *Diaphragma*) is wounded, the patient feeleth a great weight in that place, hee raveth and talketh idlely, hee is troubled with shortnes of winde, a cough, and fit of greevous pain, and drawing of the intrals upwards. Wherefore when all these accidents appear, wee may certainly pronounce that death is at hand.

The *Vena Cava* and great Arterie.

Death appeareth suddenly, by a wound of the hollow Vein, or the great Arterie, by reason of the great and violent evacuation of blood and spirits, whereby the functions of the Heart and Lungs are stopped and hindered.

The spinal marrow.

The marrow of the back bone beeing pierced, the patient is assaulted with a palsie or convulsion verie suddenly, and sence and motion faileth in the parts beneath it, the excrements of the bladder are either evacuated against the patients will, or elf are altogether stopped.

The Liver.

When the Liver is wounded, much blood commeth out at the wound, and pricking-pain dispersetk it self even unto the sword-like gristle, which hath it's situation at the lower end of the breast-bone called *Sternon*: the blood that falleth from thence down into the intestines doth often-times infer most malign accidents, yea, and somtimes death.

The Stomach.

When the stomach is wounded, the meat and drink com out at the wound, there followeth a vomiting of pure choler, then commeth sweating and coldnes, of the extreme parts, and therefore wee ought to prognosticate death to follow such a wound.

The Spleen.

When the Milt or Splene is wounded, black and gros blood cometh out at the wound, the patient will bee verie thirstie, with pain on the left side, and the blood break's forth into the bellie, and there putrifying causeth most malign and greevous accidents, and oten-times death to follow.

The Guts.

When the guts are wounded, the whole bodie is griped and pained, the excrements com out at the wound, whereat also often-times the guts break forth with great violence.

The Kidnies.

When the Reins or Kidnies are wounded, the patient will have great pain in making his urine, and the blood commeth out together therewith; the pain commeth down even unto the groin, yard, and testicles.

The Bladder.

When the Bladder and Ureters are wounded, the pain goeth even unto the entrails: the

parts

parts all about, and belonging to the groin are diſtended, the urine is bloodie that is made, and the ſame alſo commeth oftentimes out of the wound.

When the womb is wounded, the blood commeth out at the privities, and all other accidents appear, like as when the bladder is wounded. The womb.

When the ſinews are pricked or cut half aſunder, there is great pain in the affected place, and there followeth a ſudden inflammation, flux, abceſs, fever, convulſion, and oftentimes a gangrene or mortification of the part, whereof commeth death, unleſs it bee ſpeedily prevented. The nerves.

Having declared the ſigns and tokens of wounded parts, it now remaineth that wee ſet down other ſigns of certain kindes of death that are not common, or natural, whereabout when there is great ſtrife and contention made, it oftentimes is determined and ended by the judgment of the diſcreet Phyſician or Surgeon.

Therefore if it chance, that a nurſ either through drunkenneſs, or negligence, lie's upon her infant lying in bed with her and ſo ſtifle's or ſmother's it to death: If your judgment bee required, whether the infant died through the default, or negligence of the nurſ? or through ſom violent or ſudden diſeaſes that laie hidden and lurking in the bodie thereof? You ſhall finde out the truth of the matter by theſe ſigns following. Signs that an infant is ſmothered, or over-laid.

For if the infant were in good health before; if hee were not froward or crying; if his mouth and noſtrils, now beeing dead, bee moiſt'ned or bedewed with a certain foam, if his face bee not pale, but of a Violet or Purple color; if when the bodie is opened the Lungs bee found ſwoln and puffed up, as it were with a certain vaporous foam and all other intrals ſound; it is a token that the infant was ſtifled, ſmothered or ſtrangled by ſom outward violence.

If the bodie or dead corps of a man bee found lying in a field, or houſ alone, and you bee called by a Magiſtrate to deliver your opinion, whether the man were ſlain by lightning or ſom other violent death? You may by the following ſigns finde out the certaintie hereof.

For everie bodie that is blaſted, or ſtricken with lightning, doth caſt forth or breathe out an unwholſom, ſtinking or ſulphureous ſmel, ſo that the birds or fowls of the air, nor dogs will not once touch it, much leſs preie or feed on it: the part that was ſtricken oftentimes ſound, and without a wound, but if you ſearch it well, you ſhall finde the bones under the skin to bee bruiſed, broken or ſhivered in pieces. Signs of ſuch as are ſlain by lightning.

But if the lightning hath pierced into the bodie, which making a wound therein (according to the judgment of *Plinie*) the wounded part is far colder then all the reſt of the bodie. For lightning driveth the moſt thin and fierie air before it, and ſtriketh it into the bodie with great violence, by the force whereof the heat that was in the part is ſoon diſperſed, waſted aud conſumed. Lightning doth alwaies leav ſom impreſſion or ſign of ſom fire either by uſtion or blackneſs: for no lightning is without fire. *Lib.2.cap.54.*

Moreover whereas all other living creatures when they are ſtricken with lightning fall on the contrarie ſide, onely man falleth on the affected ſide, if hee bee not turned with violence toward the coaſt or region from whence the lightening came.

If a man bee ſtricken with lightening while hee is aſleep, hee will bee found with eies open; contrariwiſe, if hee bee ſtricken while hee is awake, his eies will bee cloſed, as *Plinie* writeth. *Philip Commines* writeth that thoſe bodies that are ſtricken with lightning are not ſubject to corruption as others are.

Therefore in antient time it was their cuſtom neither to burn, nor burie them, for the brimſtone which the lightning bringeth with it, was unto them in ſtead of ſalt, for that by the drieneſs and fierie heat thereof it did preſerv them from putrefaction.

Alſo it may bee inquired in judgement, Whether anie that is dead and wounded, received theſe wounds alive or dead. Truely the wounds that are made of a living man, if hee die of them, after his death will appear red and bloodie, with the ſides or edges ſwoln, or pale round about: contrariwiſe, thoſe that are made in a dead man, will bee neither red, bloodie, ſwoln, nor puffed up. For all the faculties and functions of life in the bodie do ceaſ and fall together by death; ſo that thenceforth no ſpirits nor blood can bee ſent, or flow into the wounded place. Therefore by theſe ſigns which ſhall appear it may bee declared that hee was wounded dead or alive. Signs of wounds given to a living and dead man

The like queſtion may com in judgment when a man is found hanged, whether hee were dead, or alive. Therefore if hee were hanged alive, the impreſſion or print of the rope will appear red, pale, or black, and the skin round about it will bee contracted or wrinkled, by reaſon of the compreſſion which the cord hath made; alſo oftentimes the head of the *aſpera arteria* is rent and torn, and the ſecond ſpondyl, and the neck luxated or mooved out of his place. Alſo the arms and leggs will bee pale, by reaſon of the violent and ſudden ſuffocation of the ſpirits: moreover there will bee a foam about his mouth, and a foamie and filthie matter hanging out of his noſtrils, beeing ſent thither both by reaſon that the Lungs are ſuddenly heated and ſuffocated, as alſo by the convulſion and concuſſion of the brain like as it were in the falling-ſickneſs. Contrariwiſe if hee bee hanged dead, none of theſe ſigns appear: for neither the print of the rope appear's red or pale, but of the ſame color as the other parts of the bodie are, becauſ in dead men the blood and ſpirits do not flow to the greeved parts. Signs whether one bee hanged alive or dead.

Who-

Whether one found dead in the water came therein alive or dead.

Whosoever is found dead in the waters, you shall know whether they were thrown into the water alive or dead. For all the bellie of him that was thrown in alive, will bee swoln and puffed up by reason of the water that is conteined therein; certain clammie excrements com out at his mouth and nostrils, the ends of his fingers will bee worn and excoriated, becaus that hee died striving and digging or scraping in the sand or bottom of the river, seeking somwhat whereon hee might take hold to save himself from drowning. Contrariwise if hee bee thrown into the waters, beeing dead before, his bellie will not bee swol'n, becaus that in a dead man all the passages and conduits of the bodie do fall together, and are stopped and closed, and for that a dead man breathe's not, there appeareth no foam nor filthie matter about his mouth and nose, and much less can the tops of his fingers bee worn and excoriated, for when a man is alreadie dead, hee cannot strive against death.

But as concerning the bodies of those that are drowned, those that swim on the upper part of the water beeing swoln or puffed up, they are not so by reason of the water that is conteined in the bellie, but by reason of a certain vapor, into which a great portion of the humors of the bodie are converted by the efficacie of the putrifying heat. Therefore this swelling appeareth not in all men which do perish, or else are cast out dead into the waters, but onely in them which are corrupted with the filthiness or muddiness of the water, long time after they were drowned, and cast on the shore.

Of such as are smothered by Charcoal.

But now I will declare the accidents that com to those that are suffocated and stifled or smothered with the vapor of kindled or burning-charcoals, and how you may fore-tel the causes thereof by the historie following. In the yeare of our Lord God 1575. the tenth daie of May, I with *Robert Greauline* Doctor of Physick, was sent for by Master *Hamel* an Advocate of the Court of Parlament of *Paris*, to see and shew my opinion on two of his servants, of whom the one was his Clerk, and the other his Horse-keeper. All his familie supposed them dead, becaus they could not perceiv or feel their Arteries to beat, all the extreme parts of their bodies were cold, they could neither speak nor moov, their faces were pale and wan, neither could they bee raised up with anie violent beating or plucking by the hair. Therefore all men accounted them dead, and the question was onely of what kinde of death they died, for their master suspected that som bodie had strangled them, others thought that each of them had stopped one another's winde with their hands: and others judged that they were taken with a sudden apoplexie. But I presently inquired whether there had been anie fire made with coals in the hous lately, whereunto their master giving ear, sought about all the corners of the chamber (for the chamber was verie little and close) and at last found an earthen-pan with charcoal half burned: which when wee once saw, wee all affirmed with one voice, that it was the caus of all this misfortune, & that it was the malign fume and venemous vapor, which had smothered them, as it were by stopping the passages of their breath. Therefore I put my hand to the regions of their hearts, where I might perceiv that there was som life remaining by the heat and pulsation that I felt though it were verie little, wherefore wee thought it convenient to augment and increas it. Therefore first of all, artificially opened their mouths, which were verie fast closed, and sticking obstinately together; and thereinto both with a spoon and also with a silver-pipe, wee put *aqua vitæ* often distilled with dissolved *hiera* and triacle; when wee had injected these medicines often into their mouths, they began to moov and to stretch themselvs, and to cast up and expel manie viscous excremental and filthie humors at their mouth and nostrils, and their lungs seemed to bee hot, as it were in their throats.

Therefore then wee gave them vomitories of a great quantitie of *Oxymel*, and beat them often violently on the last spondil of the back, and first of the loins, both with the hand and knee (for unto this place the orifice of the stomach is turned) that by the power of the vomitorie medicine, and concussion of the stomach, they might bee constrained to vomit. Neither did our purpose fal us, for presently they voided clammie, yellow and spumous phlegm and blood.

But wee not beeing content with all this, blowed up into their nostrils, out of a Goosquil, the powder of *Euphorbium*, that the expulsive facultie of the brain might bee stirred up to the expulsion of that which oppressed it; therefore presently the brain beeing shaken, or mooved with sneesing and instimulated thereunto by rubbing the chymical oil of mints on the palate and on the cheeks, they expelled much viscous and clammie matter at their nostrils.

Then wee used frictions of their arms, legs, and back-bones; and ministred sharp glysters, by whose efficacie the bellie beeing abundantly loosened, they began presently to speak and to take things that were ministred unto them of their own accord, and so came to themselvs again.

In the doing of all these things, *James Guillemeau* Surgeon unto the King, and of *Paris*, and *John* of Saint *Germanes* the Apothecarie, did much help and further us.

In the afternoon that the matter beeing well begun might have good succes, *John Hautie*, and *Lewis Thibaut*, both most learned Physicians, were sent for unto us, with whom wee might consult on other things that were to bee don. They highly commended all things that wee had don alreadie, thought it verie convenient that cordials should bee ministred unthem, which, by ingendring of laudable humors, might not onely generate new spirits, but

also

alſo attenuate and purifie thoſe that were groſs and cloudie in their bodies. The reſt of our conſultation was ſpent in the inquirie of the cauſ of ſo dire a miſchance. For they ſaid it was no new or ſtrange thing, that men may bee ſmothered with the fume and cloudie vapor of burning-coals.

For wee reade in the works of *Fulgoſius*, *Volaterenus* and *Egnatius*, that as the Emperor *Jovinian*, travelled in winter-time towards Rome, hee beeing wearie in his journie, reſted at a village called *Didaſtaves*, which divideth *Bithynia* from *Galatia*, where hee laie in a chamber that was newly made, and plaiſtered with lime, wherein they burn'd manie coals, for to drie the work or plaſtering, that was but as yet green on the walls or roof of the chamber. Now hee died the verie ſame night beeing ſmothered or ſtrangled with the deadlie and poiſonous vapor of the burned charcoal, in the mid'ſt of the night; this happened to him in the eight month of his reign, the thirtieth year of his age, and on the twentieth daie of Auguſt. But what need wee to amplifie this matter by the antient hiſtories, ſeeing that not manie years ſince three ſervants died in the houſ of *John Bigine* goldſmith, who dwelleth at the turning of the bridge of the Change, by reaſon of a fire made of coals in a cloſe chamber, without a chimnie where they laie. And as concerning the cauſſes, theſe were alledged. Manie were of opinion that it happened by the default of the vapor proceeding from the burned coals, which beeing in a place void of all air or winde, inferſ ſuch like accidents as the vapor or muſt of new wine doth, that is to ſaie, pain, and giddineſs of the head. For both theſe kinds of vapor beſides that they are crude, like unto thoſe things whereof they com, can alſo verie ſuddenly obſtruct the original of the Nervs, and ſo cauſ a convulſion, by reaſon of the groſſneſs of their ſubſtance. *Lib. 9. cap. 12. lib. 23. An hiſtorie.*

For ſo *Hipocrates* writing of thoſe accidents that happen by the vapor of new wine, ſpeaketh. If anie man beeing drunken do ſuddenly becom ſpecchleſs and hath a convulſion, hee dieth unleſs hee have a fever therewithal; or if hee recover not his ſpeech again when his drunkenneſs is over. *Sect. 5. Aph. 5.*

Even on the ſame manner the vapor of the coals aſſaulting the brain cauſſed them to bee ſpeechleſs, unmoovable and void of all ſenſ, and had died ſhortly unleſs by miniſtring and applying warm medicines into the mouth and to the noſtrils, the groſſneſs of the vapor had been attenuated, and the expullive faculties mooved or provoked to expel all thoſe things that were noiſom: and alſo although at the firſt ſight the Lungs appeared to bee grieved more then all the other parts, by reaſon that they drew the malign vapor into the bodie, yet when you conſider them well, it will manifeſtly appear that they are not grieved, unleſs it bee by the ſympathie or affinitie that they have with the brain when it is verie grievouſly afflict'd.

The proof hereof is, becauſ preſently after, there followeth an interception or defect of the voice, ſenſ and motion: which accidents could not bee unleſs the beginning or original of the nervs were intercepted or letted from performing its function, beeing burthened by ſom matter contrarie to nature.

And even as thoſe that have an apoplexie do not die but for want of reſpiration, yet without anie offence of the Lungs, even ſo theſe two young men's deaths were at hand, by reaſon that their reſpiration or breathing was in a manner altogether intercepted, not through anie default of the Lungs, but of the brain and nervs diſtributing ſenſ and motion to the whole bodie and eſpecially to the inſtruments of reſpiration. Others contrariwiſe contended and ſaid, that there was no default in the brain, but conjectured the interception of the vital ſpirits letted or hindered from going up into the brain from the heart, by reaſon that the paſſages of the Lungs were ſtopped, to bee the occaſion that ſufficient matter could not bee afforded for to preſerv and feed the animal-ſpirit. Which was the cauſ that thoſe young men were in danger of death, for want of reſpiration, without which there can bee no life. *The occaſion of the death of ſuch as have the apoplexie.*

For the heart beeing in ſuch a caſe, cannot deliver it ſelf from the fuliginous vapor that encompaſs it, by reaſon that the Lungs are obſtructed by the groſſneſs of the vapor of the coals, whereby inſpiration cannot well bee made, for it is made by the compaſſing air drawn into our bodies: but the air that compaſſeth us doth that which nature endeoureth to do by inſpiration, for it moderateth the heat of the heart, and therefore it ought to bee endued with four qualities. The firſt is, that the quantitie that is drawn into the bodie bee ſufficient. The ſecond is, that it bee cold, or temperate in quantitie. The third is, that it bee of a thin and mean conſiſtence. The fourth is, that it bee of a gentle and benign ſubſtance.

But theſe four conditions were wanting in the air which theſe two young men drew into their bodies beeing in a cloſe chamber.

For firſt, it was little in quantitie, by reaſon that ſmall quantitie that was conteined in that little cloſe chamber, was partly conſumed by the fire of coals, no otherwiſe then the air that is conteined in a cupping-glaſs is conſumed in a moment by the flame ſo ſoon as it is kindled. *Conditions of the air good to breathe in.*

Furthermore it was neither cold nor temperate, but as it were inflamed with the burning fire of coals.

Thirdly,

Thirdly, it was more grois in consistence then it should bee by reason of the admixtion of the grosser vapor of the coals: for the nature of the air is so that it may bee soon altered, and will verie quickly receiv the forms and impressions of those substances that are about it.

Lastly, it was noisom and hurtful in substance, and altogether offensive to the aierie substance of our bodies. For Charcoals are made of green wood burnt in pits under ground, and then extinguisht with their own fume or smoak, as all Colliers can tell. These were the opinions of most learned men although they were not altogether agreeable one unto another, yet both of them depended on their proper reasons. For this at least is manifest, that those passages, which are common to the brest and brain, were then stopped with the grossnes of the vapors of the coals: whereby it appeareth that both these parts were in fault, for as much as the consent and connexion of them with the other parts of the bodie is so great, that they cannot long abide sound and perfect without their mutual help by reason of the loving and friendlie sympathie and affinitie that is between all the parts of the bodie one with another.

Wherefore the ventricles of the brain, the passages of the lungs and the sleepie Arteries beeing stopped, the vital spirit was prohibited from entring into the brain, and consequently the animal spirit retained and kep't in, so that it could not com or disperse it self through the whole bodie, whence happened the defect of two of the faculties necessarie for life.

Of the signs of virginitie.

It manie times happeneth and is a question too frequently handled concerning women's maiden-heads; whereof the judgement is verie difficult. Yet som ancient women and Midwives will brag that they assuredly know it by certain and infallible signs. For (saie they) in such as are virgins there is a certain membrane of parchment-like skin in the neck of the womb, which will hinder the thrusting in of the finger if it bee put in anie thing deep, which membrane is broken when first they have carnal copulation, as may afterwards bee perceived by the free entrance of the finger. Besides, such as are defloured have the neck of their womb more large and wide; as on the contrarie, it is more contracted, strait and narrow in virgins. But how deceitful and untrue these signs and tokens are, shall appear by that which followeth; for this membrane is a thing preternatural, and which is scarce found to bee in one of a thousand from the first conformation. Now the neck of the womb will bee more open or strait according to the bignes and age of the partie. For all the parts of the bodie have a certain mutual proportion and commensuration in a well-made bodie.

Lib. de error. popul.

Joubertus hath written, that at *Lectoure* in *Gasconie*, a woman was delivered of a child in the ninth year of her age, and that shee is yet alive and called *Joan de Perié* being wife to *Videau Beche* the receiver of the amercements of the King of *Navare*: which is a most evident argument, that there are som women more able to accompanie with a man at nine years old, then manie other at fifteen, by reason of the ample capacitie of their womb and the neck thereof; Besides also, this passage is enlarged in manie by som accident, as by thrusting their own fingers more strongly thereinto by reason of som itching, or by the putting up of a Nodule, or Pessarie of the bigness of a man's yard, for to bring down the courses. Neither to have milk in their

Aph. 39. sect. 5.

brests is anie certain sign of lost virginitie; For *Hippocrates* thus write's; But if a woman which is neither with child, nor hath had one, have milk in her brests, then her courses have failed her.

Lib. 4. de hist. animal. c. 20. Lib. 12. de subtilitate.

Moreover, *Aristotle* report's that there bee men who have such plentie of milk in their brests, that it may bee sucked or milked out.

Cardan write's, that hee saw at *Venice* one *Antonie Bussey* som 30. years old, who had milk in his brests in such plentie, as sufficed to suckle a child, so that it did not onely drop, but spring out with violence like a woman's milk. Wherefore let Magistrates beware left thus admonished, they too rashly assent to the reports of women. Let Physicians and Chirurgions have a care left they do too impudently bring Magistrates into an error, which will not redound so much to the judge's disgrace, as to their's.

But if anie desire to know, whether one bee poisoned, let him search for the Symptoms and signs in the foregoing and particular treatis of poisons. But that this doctrine of making reports may bee the easier, I think it fit to give presidents, in imitation whereof the young Chirurgion may frame others. The first president shall bee of death to ensue; a second of a doubtful judgement of life and death; the third of a impotencie of a member; the fourth of the hurting of manie members.

A certificate of death.

I *A.P.* Chirurgion of *Paris*, this twentieth daie of Maie by the command of the Counsel, entred into the houf of *John Brossey*, whom I found lying in bed, wounded on his head, with a wound in his left temple, piercing the bone with a fracture and effracture, or depression of the broken bone, scales and *meninges* into the substance of the brain, by means whereof, his pulf was weak, hee was troubled with raving, convulsion, cold sweat, and his appetite was dejected. Whereby may bee gathered that certain and speedie death is at hand. In witness whereof I have signed this Report with my own hand.

Another in a doubtful case.

By the Coroner's command I have visited *Peter Lucey*, whom I found sick in bed, beeing wounded with a Halbert on his right thigh. Now the wound is of the bredth of three fingers and so deep that it pierce's quite through his thigh with the cutting also of the vein and arterie whence ensued much effusion of blood, which hath exceedingly weakned him, & caussed him to swound

swound often; now all his thigh is swoln, livid, and give's occasion to fear worst symptoms, which is the cauſ that the health and safetie of the partie is to bee doubted of.

In the loſs of a member.

By the Justice's command I entred into the houſ of *James Bertey*, to visit his own brother; I found him wounded in his right arm, with a wound of som four fingers bigneſs, with the cutting of the tendons bending the leg, and of the veins, arteries, and Nervs. Wherefore I affirm that hee is in danger of his life, by reason of the maligne symptoms that usually happen upon such wounds, such as are great pain, a fever, inflammation, abscess, convulsion, gangrene and the like. Wherefore hee stand's of provident and careful dreſsing, by benefit whereof if hee escape death, without doubt hee will continue lame, during the remainder of his life, by reason of the impotencie of the wounded part. And this I affirm under my hand.

Another in the hurts of divers parts.

Wee the Surgeons of *Paris*, by the command of the Senate, this twentieth daie of March, have visited Maſter *Lewis Vertoman*, whom wee found hurt with five wounds. The first inflicted on his head, in the middle of his fore-head-bone, to the bigneſs of three fingers, and it penetrate's even to the second table, so that wee were forced to pluck away three splinters of the same bone. The other was athwart his right cheek, and reacheth from his ear to the mid'ſt of his noſe, wherefore wee stitched it with four stitches. The third is on the mid'ſt of his bellie, of the bigneſs of two fingers, but so deep that it ascend's into the capacitie of the bellie, so that wee were forced to cut away portion of the Kall, comming out thereat, to the bigneſs of a walnut, becauſ having loſt it's natural color, it grew black and putrified. The fourth was upon the back of his left hand, the bigneſs almoſt of four fingers, with the cutting of the veins, arteries, nervs, and part of the bones of that part; whence it is, that hee will bee lame of that hand, howsoever carefully and diligently healed.

Now becauſ by hurting the spinal marrow, men becom lame, somtimes of a leg; it is fit you know that the spinal marrow descend's from the brain like a rivelet for the distribution of the nervs, who might distribute senſ and motion to all the parts under the head; wherefore if by hutting the spinal marrow, the patient's arms or hands are resolved or numb, or wholly without senſ, it is a sign theſe nervs are hurt which com forth of the fifth, sixth, seventh *vertebræ* of the neck. But if the same accidents happen to the thigh, leg or foot with refrigeration, so that the excrements flow voluntarily, without the patient's knowledg, or elſ are totally suppreſt, it is a sign that the sinews which proceed from the *vertebræ* of the loins and holie-bone are hurt, or in fault; so that the animal-facultie bestowing senſ and motion upon the whole bodie, and the benefit of opening and shutting to the sphincter-muſcle of the bladder and fundament, cannot shew it's self in theſe parts, by which means sudden death happen's, especially if there bee difficultie of breathing therewith.

A caution in making report of a woman with childe being killed

Beeing to make report of a childe killed with the mother, have a care that you make a discreet report, whether the childe were perfect in all the parts and members thereof, that the Judg may equally punish the autor thereof. For hee meriteth far greater punishment, who hath killed a childe perfectly shaped and made in all the members; that is, hee which hath killed a live-childe, then hee which hath killed an *Embryon*, that is, a certain concretion of the spermatick bodie. For *Moſes* punisheth the former with death, as that hee should give life for life, but the other with a pecuniarie mulct. But I judg it fit to exemplifie this report by a President.

I *A.P.* By the Judges command visited Mistris *Margaret Ulmarie*, whom I found sick in bed, having a strong fever upon her, with a convulsion and efflux of blood out of her womb, by reason of a wound in her lower bellie, below her navil on the right side, penetrating into the capacitie of her bellie, and the wound therein; whence it hath com to paſs, that shee was delivered before her time of a male childe, perfect in all his members but dead, beeing killed by the same wound, piercing through his scull into the marrow of the brain. Which in a short time will bee the death of the mother also. In testimonie whereof, I have put my hand and seal.

The manner how to Embalm the Dead.

I Had determined to finish this my tedious work with the precedent Treatiſ of Reports; but a better thought came into my head, which was, to bring Man, whoſe cure I had undertaken, from his Infancie, to his End, and even to his Grave; so that nothing might bee here defective which the Surgeon might by his profession, perform about man's bodie either alive, or dead. Verily there hath scarce ever been a Nation so barbarous, which hath not onely been careful for the Burial, but also for the Embalming or preserving of their dead bodies. For the verie *Scythians*, who have seemed to exceed other Nations in barbarousneſs and inhumanitie, have don this; for (according to *Herodotus*) the *Scythians* burie not the corps of their King, before that beeing embowelled and stuffed full of beaten Cypreſs, Frankincenſ, the seeds of Perſlie, and Aniſ, hee bee also wrapped in sear-cloths. The like care hath also posſeſſed the mindes of the *Ethiopians*; for having disburdened the corps of their friends, of their intrals and fleſh, they plaſtered them over, and then having thus roughcast them, they painted them over with colors so to expreſs the dead to the life; they incloſed them

The care of the *Scythians* in the Embalming their dead.

The like care of the *Ethiopians*.

them thus adorned in a hollow pillar of glass, that thus inclosed they might bee seen and yet not annoie the spectators with their smell. Then were they kept the space of a year, in the hands of their next kindred; who, during this space, offered and sacrificed to them. The year ended, they carried them forth of the cittie, and placed them about the walls each in his proper vault, as *Herodotus* affirm's. But this pious care of the dead, did far otherwise affect the *Egyptians*, then it did other nations. For they were so studious to preserv the memorie of their ancestors, that they Embalmed their whole bodie with aromatick ointments, and set them in transluent Urns, or glass-Cells in the more eminent and honored part of their houses, that so they might have them daily in their sight, and might bee as monuments, and inciters to stir them up to imitate their Father's and Grandsire's virtues. Besides also the bodies thus embalmed with aromatick and balsamick ointments, were in stead of a most sure pawn, so that if anie *Egyptian* had need of a great sum of monie, they might easily procure it of such as knew them and their neighbors, by pawning the dead bodie of som of their dead parents. For by this means the creditor was certain, that hee which pawned it would sooner lose his life, then break his promise. But if all things so unhappily succeeded with anie, so that through povertie hee could not fetch home his pawn again, but was forced to forgo it, hee was so infamous amongst all men, during the rest of his life, as one banished, or forlorn; and losing his freedom hee shall becom a servant, yea, scorned and reviled of all men, hee should bee accounted unworthie to enjoie the light and societie of men. And certainly the *Egyptians* understanding the life which wee here lead, to bee of short continuance, comparison beeing made with that which wee are to live after the separation of the soul from the bodie, they were more negligent in building their houses they dwelt in, but in rareing the pyramids which should serv them in stead of sepulcres, they were so beyond reason sumptuous and magnificent, that for the building of one of these edifices so renowned over all the world, which King *Cheopes* begun, a hundred thousand men were everie three months, for twentie years space there kept at work: It was five furlongs, and beeing square, each side was 800. foot long, and so much in height. Almost all the pieces of marble went to the building thereof, were thirtie foot long, engraven and carved with various workmanship, as *Herodotus* report's. But before the bodies were committed to these magnificent Sepulcres, they were carried to the Salters and Embalmers, who for that purpose had allowance of out of the publick stock. These besmeared them with Aromatick, and Balsamick ointments, and sewed up the incisions they made, then strewed them over with salt, and then covered them with brine for 70. daies; which beeing exspired, they washed them, beeing taken thence, and all the filth beeing taken off, they wrapped them in Cotton-cloths, glued together with a certain gum; then their kinsmen placed them thus ordered in a wooden Coffin carved like to a man. This was the sacred and accustomed rite of Embalming and Burying dead bodies amongst the *Egyptians* which were of the richer sort. Our countrie-men the *French*, stirred up with the like desire, embalm the bodies of their Kings and Nobles with spices and sweet ointments. Which custom they may seem piously and christianly to have taken from the Old and New Testament, and the antient and laudable custom of the Jews; for you may read in the New Testament that *Joseph* bought a fine linnen-cloth, and *Nicodemus* brought a mixture of myrrh and Aloes about 100. pound weight, that they might embalm and burie the bodie of *Jesus Christ* our Saviour, for a sign and argument of the renovation and future integritie which they hoped for by the resurrection of the dead. Which thing the Jews had received by tradition from their ancestors. For *Joseph* in the old Testament commanded his Physicians, they should embalm the dead bodie of his father with spices.

Lib. 3. Of the *Egyptians*.

The reason of building the *Egyptians* Pyramids.

Lib. 2.

John 19. 39.

Gen. 50. 2.

The manner of embalming for a long continuance.

But the bodie which is to bee embalmed with spices for verie long continuance must first of all bee embowelled, keeping the heart apart, that it may bee embalmed and kept as the kinsfolks shall think fit. Also the brain, the scull beeing divided with a saw, shall bee taken out. Then shall you make deep incisions along the arms, thighs, legs, back, loins and buttocks, especially where the greater veins and arteries run, first that by this means the blood may bee pressed forth, which otherwise would putrefie and give occasion and beginning to putrefaction to the rest of the bodie; and then that there may bee space to put in the aromatick powders; the whole bodie shall bee washed over with a spunge dipped in *aqua vitæ*, and strong vineger, wherein shall bee boiled wormwood, aloes, coloquintida, common salt and alum. Then these incisions, and all the passages and open places of the bodie, and the three bellies shall bee stuffed with the following spices grosly powdered. R. *pul. rosar. cham. mem. melil. balsami, menthæ, anethi, salviæ, lavend. rorismar. marjoran. thymi, absinthii, cyperi, calami aromat. gentianæ, irios florent. assæ odoratæ, caryophyll. nucis moschat, cinnamomi, styracis, calamitæ. benjomi. myrrhæ, aloes, santal. omnium quod sufficit.* Let the incisions bee sowed up and the open spaces that nothing fall out; then forthwith let the whole bodie bee annointed with Turpentine dissolved with oil of Roses and Camomil, adding, if you shall think it fit, som Chymical oils of spices, and then let it bee again strewed over with the fore-mentioned powder; then wrap it in a linnen-cloth, and then in sear-cloths.

How to embalm bodies when as wee want spices.

Lastly, let it bee put in a Coffin of Lead, sure soudered and filled up with drie sweet herbs. But if there bee no plentie of the fore-mentioned spices, as it usually happen's in besieged towns, the Surgeon shall bee contented with the powder of quenched lime, common ashes made of oke-wood.

For thus the bodie beeing over and above washed in strong vinegar, or Lee, shall bee kept a long time, if so bee that a great dissolving heat do not bear swaie, or if it bee not put in a hot and moist place. And this condition of time and place is the cause why the dead bodies of Princes and Kings, though embalmed with Art and cost, within the space of six or seven daies, in which they are kept to bee shewed to the people after their embalming, do cast forth so greevous a sent, that none can indure it; so that they are forced to bee put in a leaden Coffin. For the air which incompasseth them groweth so hot by reason of the multitude of people flowing to the spectacle, and the burning of lights night and daie, that the small portion of the native heat which remaineth beeing dissipated, they easily putrefie, especially when as they are not first moistened and macerated in the liquor of aromatick things, as the *Ægyptians* antiently used to do, steeping them in brine for 70 daies, as I formerly told you out of *Herodotus*. I put in minde hereby, use, that so the embalming may becom the more durable, to steep the bodies (beeing embowelled, and pricked all over with sharp bodkins, that so the liquor hindering putrefaction may penetrate the deeper into them) in a wooden tub filled with strong vinegar of the decoction of aromatick and bitter things, as Alöes, Rue, Wormwood, and Coloquintida; and there keep them for twentie daies, pouring thereinto eleven or twelv pintes of *Aqua vitæ*. Then taking it forth, and setting it on the feet, I keep it in a clear and drie place. I have at home the bodie of one that was hanged, which I begged of the Sheriff, embalmed after this manner, which remaine's sound for more then 25 yeers, so that you may tell all the muscles of the right side, (which I have cut up even to their heads, and plucked them from those that are next them for distinction's sake, that so I may view them with my eies, and handle them with my hands as often as I pleas, that by renuing my memorie I may work more certainly and surely, when as I have anie more curious operation to bee performed) the left side remain's whole, and the Lungs Heare, *Diaphragma*, stomach, splene, kidnies, beard, haiers, yea and the nails, which beeing pared, I have often observed to grow again to their former bigness.

Why the bodies of our Princes, how well forever embalmed, corrupt in a few daies.

And let this bee the bound of this our immens labor's and by God's favor, our rest, to whom Almightie, all-powerful, immortal and invisible, bee ascribed all honor and glorie for ever, and ever, *Amen*.

Labor improbus omnia vincit.

The end of the Treatis of reports, and embalming the dead.

The Apologie and Treatis, conteining the voiages made into divers places. By *Ambrose Pare* of *Laval* in *Maine*, Counsellor and chief Chirugion to the King.

The twentie ninth Book.

Of what the Adversarie accuseth the Autor.

TRuely I had not put my hand to the pen, to write on such a thing, were it not that som have impudently injured, taxed, and more through particular hatred, disgraced mee, then for zeal or love they bear to the publick good; which was, concerning my manner of tying the Veins and Arteries, writing thus as followeth.

The words of the Adversarie.

Malè igitur & nimiùm arroganter inconsultus & temerarius quidam, vasorum ustionem post emortui membri resectionem à veteribus omnibus plurimùm commendatam & semper probatam damnare ausus est, novum quendam deligandi vasa modum, contra veteres omnes medicos sine ratione, experientiâ & judicio docere cupiens, nec animadvertit majora multò pericula ex ipsa vasorum deligatione quam acu partem sanam profundè transfigendo administrari vult, imminere quàm ex ipsa ustione. Nam si acu nervosam aliquam partem, vel nervum ipsum pupugerit, dum ità novo & inusitato modo venam absurdè conatur constringere, nova inflammatio necessariò consequetur, à qua Convulsio & convulsione cita mors. Quorum symptomatum metu Galenus non ante transversa vulnera suere audebat (quod tamen minùs erat periculosum) quàm musculorum aponeuroses denudâsset. Adde quòd forcipes quibus post sectionem iterum carnem dilacerat, ciùm retracta versùs originem vasa se posse extrahere somniat, non minorem adferant dolorem quàm ignita ferramenta admota. Quod si quis laniatum expertus incolumis evaserit, is Deo optimo maximo, cujus Beneficentiâ crudelitae istâ & carnificinâ liberatus est, maximas gratias habere & semper agere debet; which is thus: Ill then, and too arrogantly a certain indiscreet and rash person would blame and condemn the cauterizing of vessels after the amputation of a rotten and corrupted member, much praised and commended and alwaies approved by the Antients; desiring to shew and teach us without reason, judgment, and experience, a new waie to tie the vessels, against the opinion of

of the Antient Physicians, taking no heed, nor beeing well advised, that there happen's far greater perils, and accidents, through this new waie of tying the vessels (which hee will have to bee made with a needle, piercing deeply the soun d part) then by the burning and ustion of the said vessels; for if the needle shall prick anie nervous part, yea the nerv it self, when hee shall by this new and unaccustomed waie absurdly constrein the vein by bindeing it, there must necessarily follow a new inflammation; from an inflammation, a convulsion; from a convulsion, death: for fear of which accidents, *Galen* never durst stitch transversal wounds, (which notwithstanding were less dangereus) before hee had discovered the Aponeuroses of the muscles. Moreover the pincers with which, after the section, the flesh is again dilacerated, while hee think's to draw the vessels out which are drawn in toward their original, bring no less pain then the cautering irons do. And if anie one having experimented this new manner of crueltie have escaped danger, hee ought to render thanks to Almightie God for ever, through whose goodness hee hath been free'd from such tyrannie, feeling rather his executioner then his methodical Chirurgion.

The Autoes answer. O what sweet words are here for one, who is said to bee a wise and learned Doctor? hee remember's not that his white beard admonisheth him, not to speak anie thing unworthie of his age, and that hee ought to put off and drive out of him all envie and rancor conceived against his neighbor. So now I will prove by autoritie, reason and experience, that the said Veins and Arteries ought to bee tied.

Autorities.

AS for Autorities, I will com to that of that worthie man *Hippocrates*, who wil's and command' the cure of Fistula's in the fundament by ligature, as well to consume the callositie, as to avoid hemorragie. In the book of Fistula's of the fundament chap. 3. book. 5. leaf 4.

Galen, Treatis 2. chap. 17. in his method, speaking of a flux of blood made by an outward caus, of whom see here the words, It is (saith hee) most sure to tie the root of the vessel, which I understand to bee that which is most near to the Liver, or the heart.

Avicen, Treatis 3. doct. 1. chap. 3. command's to tie the vein and the Arterie, after it is discovered towards his original.

Guido of *Cauliac*, speaking of the wounds of the Veins and Arteries, injoineth the Chirurgion to make the ligature in the vessel.

Master *Hollier* in the 3. book, chap. 4. of the matter of Chirurgerie, speaking of a flux of blood, command's expressly to tie the vessels.

Calmetheus in the 12. chap. of the wounds in the Veins and Arteries, tel's a most sure waie to staie a flux of blood, by ligature of the vessel.

Celsus, chap. 26. book 5. from whom the said Physician hath snatched the most part of his book, chargeth expresly, to tie the vessels in a flux of blood happening to wounds, as a remedie most easie & most sure.

Vesalius in his Chirurgerie, chap. 4 book 3. willeth that the vessels bee tied in a flux of blood.

John de Vigo, book 1. treatis 1. treating of a hemorragie in bleeding wounds, command's to tie the Vein, and the Arterie.

Tegaultius chap. 12. book 2. treating of the means to staie the flux of blood, command's to pinch the Vein or Arterie with a Crow or Parrat's-bill, then to tie it with a verie strong thred.

Peter of *Argillata* of *Bullongne*, treatis 4. chap. 11. book. 1. discoursing of a flux of blood, and the means to stop it, giveth a fourth waie expresly, which is made by ligature of the vessels.

John Andreas a Cruce, a *Venetian*, book 1. sect. 3. chap. 16. pag. 5. upon the 88. chap. of the book of *Paul* make's mention of a method, to staie a flux of blood by the ligature of the vessels.

D' Alechamp command's to tie the Veins and Arteries.

See then (my little good man) the autorities which command you to tie the vessels. As for the reasons, I will debate of them.

The hemorragie (saie you) is not so much to bee feared in the section of the Call, as that of the Varices, and the incision of the temporal Arteries, as after the amputation of a member. Now you your self command that in cutting the Varices, the flux of blood bee stopped by the ligature of the vessels. In the book 2. chap. of Angealogie, leaf 176. You command the same in the book of Stitches 1. chap. speaking of the stitch, with the amputation and section of the Call, changed by the outward air, see heer your own words: After that must bee considered concerning the Call: for if there bee anie part corrupted, putrified, withered, or blackish: First having tied, for fear of a flux of blood, you do not bid afterward to have it cauterised; but to saie the truth, you have your eies shut, and all your senses dulled, when you would speak against so sure a method, and that it is not but through anger, and an ill will. For there is nothing which hath more power to drive reason from her seat, then choler and anger. Moreover when one come's to cauterise and dismember the parts, oftentimes when the Eschar come's to fal off, there happen's a new flux of blood: As I have seen divers times, not having yet been inspired by God, with so sure a means then, when I used the heat of fire. Which if you have not found, or understood this method in the books of the Antients, you ought not thus to tread it under your feet, and speak unluckely of one who all his life hath preferred the profit of the Common-wealth before his own particular. It is not more then reasonable to bee founded upon the saying of *Hippocrates*; in the chapter of burning, 2. book leaf 206. upon whose autoritie you serv your self, which is thus That what the medicament cureth not the iron doth, and what the iron doth not amend, the fire exterminateth: It is a thing which savor's not of a Christian, to fall to burning at the first dash without staying for anie more gentle remedies. As you your self write, in the first book leaf 5. speaking of the conditions required in a Chirurgion to cure well; which passage you borrow from som other place: for that which may bee don gently without fire, is much more commended then otherwise. Is it not a thing which all schools hold as a Maxim, that wee

must

Galen in 4. book of the *Meth.* and in the book of Art of *Hippocrates Aph.* the 8. book. 1. must alvvaies begin vvith moſt eaſie remedies, vvhich if they bee not ſufficient, vvee muſt then com to extreme, followving the doctrine of *Hippocrates*? *Galen* command's in the place before alledged, to treat or dreſs the diſeaſed quickly, ſafely, and with the leaſt pain that is poſſible. In the book of *ars parva.*

Let us com to Reaſon.

NOvv ſo it is, that one cannot applie hot irons but vvith extreme and vehement pain in a ſenſible part void of a Gangrene, vvhich vvould bee cauſ of a Convulſion, Fever, yea oft-times of Death. Moreover it vvould bee a long vvhile aftervvards before the poor patients vvere cured, becauſ that by the action of the fire there is made an eſchar, vvhich proceed's from the ſubject fleſh, vvhich beeing fallen, nature muſt regenerate a nevv fleſh in ſtead of that vvhich hath been burned; as alſo the bone remain's diſcovered and bare; and by this means, for the moſt part there remain's an ulcer incurable. Moreover there is yet another accident. It happeneth that oftentimes the cruſt beeing faln off, the fleſh not beeing vvell renued, the blood iſſueth out as it did before. But vvhen they ſhall bee tied, the ligature fal's not off until the firſt fleſh have verie vvell covered them again: vvhich is proved by *Galen* in the 5. book of his *Meth.* ſaying, that eſcharotick medicines vvhich cauſ a cruſt or eſchar, vvhenſoever they fall off, leav the part more bare then the natural habit require's. For the generation of a cruſt proceed's from the parts ſubject, and which are ſituate round about it, beeing alſo burned, as I may ſaie: wherefore by how much the part is burnt, by ſo much it loſeth the natural heat. Then tell mee when it is neceſſarie to uſe eſcarotick medicines, or cautering irons? 'Tis when the flux of blood is cauſſed by eroſion, or ſom Gangrene or putrefaction. Now is it thus? In freſh bleeding wounds there is neither Gangrene, nor putrefaction. Therefore, the cauteries ought not to bee there applied. And when the Antients commanded to applie hot irons to the mouths of the veſſels, it hath not been onely to ſtaie the flux of blood, but chiefly to correct the malignitie, or gangrenous putrefaction which might ſpoil the neighboring parts. And it muſt bee here noted, that if I had known ſuch accidents to happen, which you have declared in your book, in drawing and tying the veſſels, I had never been twice deceived; nor would I ever have left by my writings to poſteritie, ſuch a waie of ſtopping a flux of blood. But I writ it after I had ſeen it don & did it verie often, with happie ſucceſs. See then what may happen through your inconſiderate counſel, without examining, or ſtanding upon the facilitie of tying the ſaid veſſels. For ſee, heer's your ſcope and propoſition, to tie the veſſels after amputation is a new remedie, ſaie you; then it muſt not bee uſed, it is an ill argument for a Doctor.

Of what the eſchar is made.

Woeds of the adverſarie.

Propoſitions of the Adverſarie.

But as for that (ſaie you) one muſt uſe fire after the amputation of members, to conſume and drie the putrefaction, which is a common thing in Gangrenes, and mortifications, that indeed hath no place here, becauſ the practice is to amputate the part above that which is mortified, and corrupted; as *Celſus* write's and command's, to make the amputation upon the ſecond part, rather then to leav anie whit of the corrupted. I would willingly ask you, if when a vein is cut tranſverſ, and that it is verie much retracted towards the original, whether you would make no conſcience to burn till that you had found the orifice of the vein, or arterie; and if it bee not more eaſie onely with a Crow-bil to pinch and draw the veſſel, and ſo tie it? In which you may openly ſhew your ignorance, and that you have your minde ſeazed with much rancor and choler. Wee dailie ſee the ligature of the veſſels practiſed with happie ſucceſs after the amputation of a part, which I will now verifie by experiences and hiſtories, of thoſe to whom the ſaid ligature hath been made, and perſons yet living.

In 5. book c. 26. and 7. book c. 33.

In the ch. of cutting-book the 2.

Experiences.

A notable hiſtorie.

THE 16. of *June* 1582. in the preſence of M. *John Liebaud* doctor in the facultie of Phyſick at *Paris*, *Claud Viard* ſworn Surgeon, M. *Mathurin Huron*, Surgeon of Monſieur *de Souvray*, and I, *John Charbonel* M. Barber-Surgeon of *Paris*, well underſtanding the *Theorick*, and *Practick* of Surgerie, did with good dexteritie amputate the left leg of a woman tormented the ſpace of three years with extreme pain, by reaſon of a great *Caries* which was in the bone *Aſtragal*, *Cyboides*, great and little *ſocil*, and through all the nervous parts, through which ſhee felt extreme and intolerable pains night and daie: ſhee is called *Marie* of *Hoſtel*, aged 28. years, or thereabouts, wife of *Peter Herve*. Eſquire of the Kitchin to the Ladie *Ducheſs* of *Uzez*, dwelling in the ſtreet of *Verbois* on the other ſide S. *Martin* in the fields, dwelling at the ſign of the S. *John*'s-head; where the ſaid *Charbonel* cut off the ſaid leg, the bredth of 4. large fingers below the knee, & after that hee had inciſed the fleſh, & ſawed the bone, hee griped the vein with the Crow-bil, then the Arterie, then tied them; from whence I proteſt to God (which the companie that were there, can witneſs) that in all the operation that was ſuddenly don, there was not ſpilt one porrenger of blood; and I bid the ſaid *Charbonel* to let it bleed more, following the precept of *Hippocrates*, that it is good, in all wounds and alſo in inveterate ulcers, to let the blood run; by this means, the part is leſs ſubject to inflammation. The ſaid *Charbonel* continued the dreſſing of her, who was cured in two months, without anie flux of blood happening unto her, or other ill accident; and ſhee went to ſee you at your lodging beeing perfectly cured.

The operation of *Charbonel*.

In the 7. ſent. of the book of Ulcers.

Another Hiſtorie.

Another Hiſtorie of late memorie, of a ſinging-man of our Ladie's Church named M. *Colt*, who broke both the bones of his leg which were cruſht in divers pieces, inſomuch that there was no hope of cure, to vvithſtand a gangrene and mortification, and by conſequence death. Monſieur *Helin* Doctor Regent in the facultie of Phyſick, a man of honor and good knovvledg, *Claud Viard*, & *Simon Peter*, ſvvorn Surgeons of *Paris*, men vvell exerciſed in Surgerie; and *Balthazar* of *Leſtre*, and *Leonard de Leſchenal*, M. Barber-Surgeons, vvell experimented in the operations of Surgerie, vvere all of opinion, to vvithſtand the accidents aforeſaid, to make entire amputation of the vvhole leg, a little above the broken & ſhivered bones & the torn nervs, veins, arterie, ſthe operation was nimbly don, by the ſaid *Viard* and the blood ſtanch't by the ligature of the veſſels in the preſence of the ſaid *Helin*, and M. *Tonſard* great vicar of our Ladie's Church, and was continually dreſt by the ſaid *Leſchenal*, and I went to ſee him otherwhiles; hee was happily cured without the application of hot irons, and walketh luſtily on a wooden leg.

Operation don by Viard.

Another Historie. IN the year 1583. the 10. daie of *December*, *Toussaint Posson* born at *Ronieville*, at this present dwelling at *Beauvais* near *Dourdan*, having his legg all ulcered, and all the bones cariez'd and rotten, praied mee for the honor of God to cut off his leg by reason of the great pain which hee could no longer endure. After his bodie was prepared, I causſed his leg to bee cut off, four fingers below the *rotula* of the knee, by *Daniel Powlet* one of my servants, to teach him and to imbolden him in such works; and there hee readily tied the vessels to staie the bleeding, without application of hot irons, in the presence of *James Gulilemeau* ordinarie Surgeon to the King, and *John Charbonell* master-Surgeon of *Paris*: and during the cure was visited by Mr *Laffile* and M *Courtin* Doctors, Regents in the facultie of medicine at *Paris*. The said operation was made in the houſ of *John Gobel* Inn-keeper, dwelling at the sign of the white-horſ in the Greve. I will not here forget to saie, that the Ladie Princeſs of *Montpensier*, knowing that hee was poor, and in my hands, gave him monie to paie for his chamber and diet. Hee was well cured, God bee praised, and is returned home to his houſ with a woodden-leg.

Another Historie. Gangreen happening by an Antecedent cauſ. A Gangreen happened to half of the leg to one named *Nicolas Mesnager* aged 76. years, dwelling in S. *Honores* street, at the sign of the Basket; which happened to him through an inward cauſ, so that wee were constrained to cut off his leg to save his life: and it was taken off by *Antonie Renaud*, master Barber-Surgeon of *Paris* the 16. daie of *December* 1583. in the presence of M. *Le Fort*, and M *La Noue* sworn Surgeons of *Paris*; and the blood was stanched by the Ligature of the vessels, and hee is at this present cured and in health, walking with a wooden-leg.

Another Historie. A Water-man at the Port of *Neſle*, dwelling near *Monſieur de Mas*, Post-master, named *John Bousgreau*, in whoſe hands a Musket brake asunder, which broke the bones of his head, and rent and tore the other parts in such sort that it was needful and necessarie to make amputation of the hand two fingers above the wriſt: which was don by *James Guilleman* then Surgeon in ordinarie to the King, who dwelt at that time with mee. The operation likewise beeing readily don, and the blood stanch'd by the Ligature of the vessels without burning irons, hee is at this present living.

Operation don by Guilleman.

Another Historie. Operation don by the Autor. A Merchant Grocer dwelling in S. *Denis*-street at the sign of the great *Tournois* named the Judg, who fell upon his head, where was made a wound near the temporal muscle, where hee had an arterie opened, from whence issued forth blood with great impetuoſitie, insomuch that common remedies would not serv the turn; I was called thither, where I found M. *Rasse*, M. *Cointeret*, M. *Viard*, sworn Surgeons of *Paris*, to staie blood; where presently I took a needle and thred, and tied the arterie, and it bled no more after that, and was quicklie cured. M. *Rousselet* can witneſs it, not long since Deacon of your Facultie, who was in the cure with us.

Another Historie. Another operation. A Sergeant of the Chastlet dwelling near S. *Andrew des Arts*, who had a stroak of a sword upon the throat in the Clacks medow, which cut asunder the jugular vein extern, as soon as hee was hurt hee put his handkercher upon the wound, and came to look mee at my houſ, and when hee took awaie his handkercher the blood leaped out with great impetuoſitie: I suddenly tied the vein toward the root; hee by this means was stanched and cured, thanks bee to God. And if one had followed your manner of stanching blood by cauteries, I leav it to bee supposed whether hee had been cured; I think hee had been dead in the hands of the operator. If I would recite all those whoſe vessels were tied to staie the blood which have been cured, I should not have ended this long time; so that mee thinks there are Hrstories enough recited to make you believ the blood of veins and arteries is surely stanched without applying anie outward cauteries.

Du Bartas. *Hee that doth strive against experience,*
Daign's not to talk of anie learned science.

Book 2. c. 45. book 3. c. 4. book 3. c. 9. sect. 7. NOw my little master, seeing that you reproch mee that I have not written all the operations of Surgerie in my works which the Ancients write of, I should bee verie sorrie for it: for then indeed might you justly call mee *Carnifex*. I have left them becauſ they are too cruel, and am willing to follow the moderns, who have moderated such crueltie: which notwithstanding you have followed step by step, as appeareth by the operations here written, extracted from your book, which you have drawn here and there from certain ancient Autors, such as followv, and such as you have never practised nor seen.

The first operation.

In the 1 book of the chap. of Hypsyrisme, book 14 ch. Laſt of the Meth. In the 4 ch. of the 16 book of my work. TO inveterate fluxions of the eies, and Migrimes, *Paulus Ægineta* as also *Albucasis* command to make *Arteriotomie*, see here the vvords of the same *Æginete*. You mark the Arteries vvhich are behind the ears, then divide them in cutting to the verie bone, and make a great inciſion the bredth of tvvo fingers, even till the Arterie bee found, as you command to bee don in your book; but I holding the opinion of *Galen*, vvho command's to dreſs the diseased quickly, safely, and vvith the leaſt pain that is possible, I teach the young Surgeon the means to remedie such evils in opening the Arteries behinde the ears, & those of the temples, vvith one onely inciſion, as a letting blood, and not to make a great inciſion, & cut out vvork for a long time.

Book 6. c. 7. Book 2. c. 5. *The second.* In the 2. book chap. of *Periscythisme*. TO fluxions which are made a long time upon the eies, *Paul Æginete* and *Albucasis* command to make inciſion which they call *Periscethiſmos* or *Augiologie* of the Greeks; and see heer the words of *Paul*; In this operation first the head is shaved, then taking heed of touching the temporal muscles, a tranſverſ inciſion must bee made beginning at the left temple and finiſhing at the right, which you have put in your book word for word, without changing anie thing: which sheweth openly you are a right wound-maker; as may bee seen in the Chapter which you call the Crown cut, which is made half round under the Coronal suture from one temple to another even to the bone. Now I do not teach such a cruel kinde of remedie, but inſtruct the operator by reason, autoritie and notable proof of a sure and certain waie to remedie such affecti-

In the 26. ch. of the 9. book of my works.

ons without butchering men in this kinde.

In

The third. Book 6.ch.44 book 2.ch. 3. book 3.ch.22

IN the cure of *Empyema*, *Paul Æginet*, *Albucraſis* and *Celſus* commanded to applie ſom thirteen, others fifteen Cauteries to give iſſue to the matter conteined in the breſt, as the ſaid *Celſus* in the afore-ſaid place appointeth for Aſthmatick people, which is a thing out of all reaſon (which reſpect to their honor bee it ſpoken) that ſince the Surgeon's ſcope is to give iſſue to the matter therein conteined, there is no other queſtion then to make apertion, to evacuate the matter in the moſt inferiour part, I have ſhewed the young Surgeon the means to do it ſafely, without tormenting the patients for nothing.

The fourth. *Guido* of Cauſine the 2. treatiſ. Doct. 1. chap. 1. Book 7. chap. 10. book 6. chap. 46. book 2. chap. 47.

IN Paps that are too great, *Paul Æginet* and *Albucraſis* command's to make a croſs-inciſion, to take out all the fat, and then join together the wound by ſtitch: in brief, it is to flea a man alive, which I have never practiſed, nor counſel it to bee don by the young Surgeon.

The fifth. In the firſt book, chap. 29. and 30. alſo in book 2. chap. 32. book 6. chap. 47. and 48.

Albucraſis and *Paul Æginet* will cauterize the Liver and the Splene with hot irons, which the moderns have never practiced; for indeed reaſon is manifeſtly repugnant thereunto.

The ſixth. In the 5. book chap. 1. *De internis morbis.* book 1. chap. 33. book 3. ſect. 2. chap. 89. book 6. chap. 50 In the 3. book 12. ch. 6, 7.

IN the *Paracenteſis* which is made in the third kinde of Dropſie called *Aſcites*, *Celius Aurelianus* commandeth divers apertions to bee made in the bellie. *Albucraſis* applie's nine actual cauteries, that is to ſaie, four about the Navel, one upon the Stomach, one upon the Splene, one upon the Liver, two behinde the ſpondyls, one of them near the breſt, the laſt near the ſtomach. *Ætius* is likewiſe of the ſame opinion, to open the bellie with divers cauteries. *Paul Æginet* command's to applie five actual cauteries to make the ſaid *Paracenteſis*. But abhorring ſuch a kinde of burning, of which you ſpeak much in your third book, I ſhew another kinde of practice, the which is don by making a ſimple inciſion in the ſaid bellie, as may bee ſeen in my works, with happie ſucceſs. I do not teach young men in my works the manner of burning, which the Antients have called *infibulare*, that is not in practice though *Celſus* writeth of it.

The ſeventh. In the 7. book c. 25. book 6. c. 76. book 2. c. 72 upon the ſentence 49. of the 1. ſection of the book of Arts.

IN the Sciatick proceeding from an internal cauſ and becauſ the viſcous humors diſplace the bones, *Paul* command's to burn or cauterize the ſaid joint to the bone: *Diaſcorides* command's the ſame, Which I do not find expedient, taking indication from the ſubjacent parts: for there where one would burn, 'tis in the place of four twin-muſcles, under which paſſeth the great Nerv deſcending from the Holie-bone; which beeing burnt, I leav it to your cenſure what might happen, as *Galen* remarketh ſpeaking of the *uſtion* which muſt bee made in the ſhoulders called *humerus*.

The eighth. Sentence the 22 and 23. of the 3. ſection of the book of the joints c. 16. of the 15. book.

IN the outward laxation of the Spondyls, *Hippocrates* command's to binde the man right upon a Ladder, the Arms and Legs tied and bound: then afterwards having raiſed the Ladder to the top of a tower, or the ridg of an houſ, with a great rope in a pullie, then to let the patient fall plumb down upon the hard pavement; which *Hippocrates* ſaie's was don in his time. But I do not ſhew of anie ſuch waie of giving the ſtrapado to men, but I ſhew the Surgeon, in my works, the waie to reduce them ſurely, and without great pain. Moreover I ſhould bee ſorrie to follow the ſaying of the ſaid *Hippocrates*, In the third book *De morbis*, who command's in the diſeaſ called *Volvulus* to cauſ the bellie to bee blown with a pair of bellows, putting the noſel of them into the *inteſtinum rectum*, and then blow there till the bellie bee much ſtretcht, afterwards to give an emollient glyſter, and to ſtop the fundament with a ſponge. Such practice as this is not made now a daies, therefore wonder not if I have not ſpoken of it. And you not beeing contented to patch together the operations of the above-ſaid Autors, you have alſo taken divers in my works, as everie man may know: which ſheweth manifeſtly that there is nothing of your own in your Surgeon's Guide. I leav out divers other unprofitable operations which you quote in your book, without knowing what beaſts they are, in never having ſeen them practiſed; but becauſ you have found them written in the books of the Antients, you have put them into your book.

Moreover you ſaie that you will teach me my leſſon in the operations of Surgerie, which I think you cannot do: becauſ I have not onely learned them in my ſtudie, and by the hearing of manie years the leſſons of Doctors of Phyſick: but as I have ſaid before in my epiſtle to the Reader, I was reſident the ſpace of 3. years in the Hoſpital of *Paris*, where I had the means to ſee and learn divers works of Surgerie, upon divers diſeaſes, together with the Anatomie, upon a great number of dead bodies, as oftentimes I have ſufficiently made trial publickly in the Phyſicians ſchool at *Paris*, and my good luck hath made mee ſeen much more. For beeing called to the ſervice of the King of France (four of which I have ſerved) I have been in companie at battels, skirmiſhes, aſſaults, and beſeiging of citties and fortreſſes; as alſo I have been ſhut up in citties with thoſe that have been beſieged, having charge to dreſs thoſe that were hurt. Alſo I have dwelt manie years in this great and famous cittie of *Paris*, where, thanks bee to God, I have lived in verie good reputation amongſt all men, and have not been eſteemed the leaſt in ranck of men of my profeſſion, ſeeing there was not anie cure, were it never ſo difficult and great, where my hand and my counſel have not been required, as I make it appear in this my work. Now dare you (theſe things beeing underſtood) ſaie you will teach mee to perform the works of Surgerie, ſince you never went further then your ſtudie? The operations of the ſame are four in general (as wee have declared heretofore) where you may make but three, that is to ſaie, join that which is ſeparated, ſeparate that which was conjoined, and to take awaie that which is ſuperfluous, and the fourth which I make, is as much neceſſarie as induſtrious invention, to add to nature that which is wanting, as I have ſhewed here above. Alſo it is your will that the Surgeon make but three operations above-ſaid without medling to ordain a ſimple Cataplaſm, ſaying it is that which com's to your part belonging to the Phyſician: And that the Antients (in the diſcourſ which you have made to the Reader) have divided the practice of Phyſick

into three kindes, that is to ſay, Diet, Medicine and Chirurgerie. But I would willingly demand of you who hath made the partition, and where anie thing ſhould bee don, who are thoſe which are content with their part, without anie enterprize upon the other? For *Hippocrates, Galen, Ætius, Avicen,* in brief, all the Phyſicians, as well Greeks and Latins as Arabians, have never ſo treated of the one, that they have not treated of the other, for the great affinitie and tie that there is between them two, and it ſhould bee verie difficult to do otherwiſe. Now when you will vilifie Chirurgerie ſo much, you ſpeak againſt your ſelf; for in your Epiſtle which you have dedicated to Monſieur of *Martignes*, you ſay, that Chirurgerie is the moſt noble part of Phyſick, as well by reaſon of the original antiquitie, neceſſitie, as certaintie in her actions; for ſhee work's *Luce apertâ*, as learnedly writeth *Celſus* in the beginning of his ſeventh book; therefore it is to bee believed you never went out of your ſtudie, but to teach *Theorick* (if you have been able to doe it.)

A fair ſimilitude. The operations of Chirurgerie are learnt by the eie, and by the touch. I will ſay that you much reſemble a yong Lad of low *Britanie*, of plump buttocks, where was ſtuff ſufficient; who demanded leav of his father to com to *Paris*, to take *France*; beeing arrived the Organiſt of our Ladies Church met with him at the Pallace-gate, who took him to blow the Organs, where hee was remaining three years: hee ſaw hee could ſomwhat ſpeak *French*, hee return's to his Father, and told him that hee ſpake good *French*, and moreover hee knew well, to plaie on the Organs: his father received him verie joifully, for that hee was ſo wiſe and learned in ſo ſhort a time. Hee went to the Organiſt of their great Church, and praied him to permit his ſon to plaie on the Organs, to the end hee might know whether his ſon was becom ſo skilful a maſter, as hee ſaid hee was; which the Organiſt agreed to verie willingly. Beeing entred to the Organs, hee caſt himſelf with a full leap to the bellows, the maſter Organiſt bid him plaie, and that hee would blow; then this good maſter anſwer's, Let him plaie himſelf on the organs if hee would for him, hee could do nothing but plaie on the bellows. I think alſo my little maſter, that you know nothing elſ, but to prattle in a chair; but I will plaie upon the keies, and make the Organs ſound (that is to ſay) I will do the operations of Chirurgerie, that which you cannot in anie wiſe doe, becauſ you have not gon from your ſtudie or the ſchools, as I have ſaid before. But alſo, as I have ſaid alreadie in the Epiſtle to the Reader, that the laborer doth little profit by talking of the ſeaſons, diſcourſ of the manner of tilling the earth, to ſhew what ſeeds are proper to each ſoil; all which is nothing if hee put not his hand to the Plough, and couple the Oxen together. So likewiſe is it no great matter if you do not know the *Practick*, for a man may execute Chirurgerie well, although hee have no tongue at all. As *Cornelius Celſus* hath verie well remarked in his firſt book when hee ſaith, *Morbos non eloquentiâ, ſed remediis curari: quæ ſi quis elinguis, uſu diſcretus bene norit, hunc aliquanto majorem medicum futurum, quàm ſi ſine uſu linguam ſuam excoluerit*; that is to ſay; Diſeaſes are not to bee cured by eloquence, but by remedies well and duely applied, which if anie wiſe and diſcreet man though hee have no tongue know well the uſe thereof, this man in time ſhall becom the greater Phyſician, than if without practiſe his tongue were dip't with oratorie; the which you your ſelf confeſs in your ſaid book by a Tetraſtick which is thus:

To talk's not all in Chirurgions Art,
But working with the hands;
Aptly to dreſs each grieved part,
And guid, fire, knife, and bands.

Ariſtotle in the firſt book of his Metaphyſicks the firſt chapter ſaith, Experience is almoſt like unto ſcience, and by the ſame, Art and ſcience have been invented. And indeed wee ſee theſe which are experimented, attain ſooner to that which they intend, then thoſe which have reaſon and not experience, becauſ that the ſaid experience is a knowledg of ſingular and particular things, and ſcience on the contrarie is a knowledg of things univerſal. Now that which is particular is more healable then that which is univerſal therefore thoſe which have experience are more wiſe and more eſteemed, then thoſe which want it, by reaſon they know what they do. Moreover I ſay, that ſcience without experience, bringeth no great aſſurance.

Alciat a Doctor of *Milan*, boaſted one daie of himſelf, that his glorie was greater and more famous then that of Counſellors, *Preſidents*, maſters of Requeſt: becauſ that it was by his ſcience, and his inſtructions that they became ſuch: but hee was anſwered by a Counſellor, that he was like unto a whetſtone, which made the knife ſharp and readie to cut, not beeing able ſo to do it ſelf, and alledged the verſes of *Horace* that;

Fungebatur vice cotis, acutum
Reddere quæ ferrum valet, exors ipſa ſecandi.

See you now (my little maſter) my anſwers to your calumniations, and pray you, if you bear a good minde (to the publick good) to review and correct your book, as ſoon as you can, and not to hold young Chirurgions in this error by the reading of the ſame, where you teach them to uſe hot irons after the amputation of members, to ſtaie a flux of blood, ſeeing there is another means, and not ſo cruel and more ſure and eaſie. Moreover if to daie after an aſſault of a Citie, where diverſ Souldiers have had arms and leggs broken, and ſhot off by Cannon-bullets, Cutlas and other inſtruments of war; to ſtaie the flux of blood, if you ſhould uſe hot irons, it would bee needful to have a forge, and much coals to heat them: and alſo the ſouldiers would hold you in ſuch horror for this crueltie, that they would kill you like a Calf, even as in times paſt they did one of the chieſeſt Chirurgions of *Rome*, which may bee found written before in the third chapter of the Introduction of Surgerie, the 1. book. Now leſt the Sectators of your writings ſhould fall into ſuch inconveniencie, I praie them to follow the method aforeſaid, the which I have ſhewed to bee true and certain, and approoved by autoritie, reaſon and experience.

The Voiage of Thurin, 1535.

MOreover, I will here ſhew to the readers the places where I have had means to learn the Art of Surgerie. for the better inſtructing of the young Surgeon: and firſt in the year 1536. the great King *Francis* ſent a great Armie to *Thurin*, to recover the Cittie and Caſtles, which the Marqueſs of *Guaſt*, Lieutenant-General of the Emperor had taken: where the high Conſtable of *France* the great Maſter, was Lievtenant-General of the Armie, and Monſier *de Montain* Colonel-General of the Foot, of which I was then Surgeon. A great part of the Armie arrived in the Countrie of *Suze*; wee found the enemie which ſtopt the paſſage, and had made certain Forts, and Trenches, inſomuch that to hunt them out and make them leav the place, wee were forced to fight, where there were divers hurt and ſlain, as well of the one ſide as of the other: but the enemies were conſtrained to retire, and get into the Caſtle, which was cauſſed partly by one Captain *Ratt*, who climed with divers of the ſouldiers of his companie upon a little Mountain; there where hee ſhot directly upon the enemies, hee received a ſhot upon the ankle of his right foot, wherewith preſently hee fell to the ground; and ſaid then, Now is the *Rat* taken. I dreſſed him, and God healed him. Wee entred the throng in the Citie, and paſſed over the dead bodies, and ſom which were not yet dead, wee heard them crie under our horſe's-feet, which made my heart relent to hear them. And truly I repented to have forſaken *Paris* to ſee ſo pitiful a ſpectacle. Beeing in the Citie, I entred into a ſtable thinking to lodg my own, and my man's horſ, where I found four dead ſouldiers, and three which were leaning againſt the wall, their faces wholly disfigured, and neither ſaw nor heard, nor ſpoke: and their clothes did yet flame with gun-powder which had burnt them. Beholding them with pittie, there happened to com an old Souldier, who asked mee if there were anie poſſible means to cure them, I told him no: hee preſently approached to them, and cut their throats without choler. Seeing this great crueltie, I told him hee was a wicked man, hee anſwered mee that hee praied to God, that whenſoever hee ſhould bee in ſuch a caſe, that hee might finde ſom one that would doe as much to him, to the end that hee might not miſerably languiſh. And to return to our former diſcourſ, the enemie was ſummoned to render, which they ſoon did, and went out, their lives onely ſaved, with a white ſtaff in their hands; the greateſt part whereof went and got to the Caſtle of *Villane*, where there was about 200. Spaniards; Monſier the Conſtable would not leav them behinde, to the end that the waie might bee made free. This Caſtle is ſeated upon a little mountain, which gave great aſſurance to them within, that one could not plant the Ordnance to beat upon it, and were ſummoned to render, or that they ſhould bee cut in pieces; which they flatly refuſed, making anſwer, That they were as good and faithful ſervants to the Emperor, as Mounſier the Conſtable could bee to the King his maſter. Their anſwer heard, they made by force of arm, two great Cannons to bee mounted in the night with cords and ropes, by the Swiſſers and Lanſquenets; when as the ill luck would have it, the two Cannons beeing ſeated, a Gunner by great negligence ſet on fire a great bag of gun-powder; wherewith hee was burned together with ten or twelv ſouldiers; and moreover the flame of the powder was a cauſ of diſcovering the Artillerie, which made them, that all night they of the Caſtle did nothing but ſhoot at that place where they diſcovered the two pieces of Ordnance, wherewith they kil'd & hurt a great number of our people.

The retiring of the enemie.

Hiſtorie.

Brave anſwer of the ſouldiers.

The next daie early in the morning a Batterie was made, which in a few hours made a breach, which beeing made, they demanded to parlie with us; but 'twas too late for them: For in the mean time our French foot ſeeing them amazed, mounted to the breach, and cut them all in pieces, except a fair young luſtie maid of *Piedmont*, which a great Lord would have kept and preſerved for him to keep him companie in the night, for fear of the greedie wolf. The Captain and Enſign were taken alive, but ſoon after were hanged upon the gate of the Cittie, to the end they might give example and fear to the Imperial ſouldiers not to bee ſo raſh and fooliſh, to bee willing to hold ſuch places againſt ſo great an Armie. Now all the ſaid ſouldiers of the Caſtle, ſeeing our people comming with a moſt violent furie, did all their endevour to defend themſelvs, they kil'd and hurt a great companie of our ſouldiers, with pikes, muskets, and ſtones, where the Surgeons had good ſtore of work cut out. Now at that time I was a freſh water ſouldier, I had not yet ſeen wounds made by gun-ſhot at the firſt dreſſing. It is true, I had read in *John de Vigo*, in the firſt book of Wounds in General, the eighth Chapter, that wounds made by weapons of fire did participate of Venenoſitie, by reaſon of the powder, and for their cure command's to cauterize them with oil of Elders ſcalding-hot, in which ſhould bee mingled a little treacle; and not to fail, before I would applie of the ſaid oil, knowing that ſuch a thing might bring to the patient great pain, I was willing to know firſt, before I applied it, how the other Surgeons did for the firſt dreſſing, which was to applie the ſaid oil the hotteſt that was poſſible into the wounds, with tents and ſetons; inſomuck that I took courage to do as they did. At laſt I wanted oil, and was conſtrained in ſtead thereof, to applie a digeſtive of yelks of eggs, oil of roſes, and turpentine. In the night I could not ſleep in quiet, fearing ſom default in not cauterizing, that I ſhould finde thoſe to whom I had not uſed the burning-oil dead impoiſoned; which made mee riſe verie earlie to viſit them, where beyond my expectation, I found thoſe to whom I had applied my digeſtive medicine, to feel little plain, and their wounds without inflammation or tumor, having reſted reaſonable well that night: the other to whom was uſed the ſaid burning-oil, I found them feveriſh, with great pain and tumor about the edges of their wounds. And then I reſolved with my ſelf, never ſo cruelly to burn poor men wounded with gun-ſhot. Beeing at *Thurin*, I found a Surgeon, who had the fame above all others, for the curing of wounds of gun-ſhot, into whoſe favor I found means to inſinuate my ſelf, to have the receit of his Balm, as hee called it wherewith hee dreſſed wounds of that kinde, and hee held mee of the ſpace of two years, before I could poſſible draw the Receit from him. In the end by gifts and preſents hee gave it mee, which was this, to boil young whelps newy pupped, in

Counſil of *de Vigo*.

Experience of a bold man's happie ſucceſs.

oil

Receit of an excellent balm for wounds with gun ſhot.

oil of Lilies, prepared earth-worms, with Turpentine of *Venice*. Then was I joiful and my heart made glad, that I had underſtood his remedie, which was like to that which I had obtained by great chance. See then how I have learned to dreſs wounds made with gun-ſhot, not by books. My Lord Marſhal of *Montian* remained Lieutenant-General for the King in *Piedmont*, having ten or twelv thouſand men in garriſon through the Citties and Caſtles, who often combated with ſwords and other weapons, as alſo with muskets; and if there were four hurt, I had alwaies three of them; and if there were queſtion of cutting off an arm or a leg, or to trepan, or to reduce a fracture or diſlocation, I brought it well to paſs. The ſaid Lord Marſhal ſent mee one while this waie, another while that waie, for to dreſs the appointed Souldiers which were beaten as well in other Citties as that of *Thurin*, inſomuch that I was alwaies in the Countrie one waie or other. Monſieur the Marſhal ſent for a Phyſician to *Milan*, who had no leſs reputation in the medicinal Art (then the diſeaſed Monſieur *le Grand*) to take him in hand for an hepatical flux, whereof at laſt hee died. This Phyſician was a certain while at *Thurin* to deal with him, and was often called to viſit the hurt people, where hee alwaies found mee, and I conſulted with him, and ſom other Surgeons, and when wee had reſolved to do anie ſerious work of Surgerie, 'twas *Ambroſe Pare* that put his hand thereto, where I did it promptly and with dexteritie, and with a great aſſurance, in ſo much that the ſaid Phyſician admired mee, to ſee mee ſo readie in the operation of Surgerie, ſeeing the ſmall age which I had. One daie diſcourſing with the ſaid Lord Marſhal, hee ſaid to him, *Signor tu, hai un Chirurgico giovane di anni, ma egli è vecchio di ſapere è di eſperientia. Guarda lo bene, perche egli ti fara ſervicio & honore.* That is to ſaie, Thou haſt a young Surgeon of age, but hee is old in knowledg and experience, preſerv him well, for hee will do thee ſervice and honor. But the old man knew not that I had dwelt three years in the Hoſpital of *Paris*, there to dreſs the diſeaſed. In the end Monſieur *Marſhal* died with his hepatical flux. Beeing dead, the King ſent Monſieur the Marſhal of *Annebaut* to bee in his place, who did mee this honor to praie mee to dwell with him, and that hee would uſe mee as well or better, then Monſieur the Marſhal *Montian*; which I would not do for the grief I had for the loſs of my maſter who loved mee intimately, and I him in the like manner; and ſo I came back to *Paris*.

Witneſs of the dexteritie of the Autor

The death of Marſhal Montian.

The Voiage of Marolle and of low Britanie, 1543.

I Went to the Camp of *Marolle*, with the deceaſed Monſieur *de Roban*, where King *Francis* was in perſon; and I was Surgeon of the companie of the ſaid Monſieur *de Roban*. Now the King was advertiſed by Monſieur *de Eſtampes*, governor of *Britanie*, that the *Engliſh* had hoiſt ſail to land in Low *Britanie*, and praied him that hee would ſend Monſieur *de Roban*, and Monſieur *de Laval* for ſuccour, becauſ they were the Lords of that Countrie, and for their ſakes thoſe of that Countrie would beat back the enemie and keep them from landing. Having received this advertiſement, his Majeſtie diſpatched to ſend the ſaid Lords for the relief of their Countrie, and to each was given as much power as to the Governor; in ſo much that they were all three the King's Lieutenants. They took willingly this charge upon them, and ſpeedily went away in Poſte, and lead mee with them to *Landreneau*, there where wee found everie one in arms, the Alarum-bells ſounding on everie ſide, yea, five or ſix leagues about the *Harbors*, that is to ſaie, *Breſt*, *Conquet*, *Crozon*, *Le Fou Doulac*, *Laudanec*, each of them well furniſht with Artillerie; as Cannons, Demie-cannons, Culverins, Sakers, Serpentines, Falcons, Harquebuzes: in brief, there was nothing wanting in Artillerie, or Souldiers, as well *Britains* as *French*, to hinder that the Engliſh made no landing, as they had reſolved at their parting from England. The enemie's Armie came unto the verie mouth of the Cannon, and when wee perceived them that they would land, they were ſaluted with Cannon-ſhot, and wee diſcovered our men of War, together with our Artillerie, they fled to Sea again: where I was glad to ſee their veſſels hoiſ ſail again, which was in a great number and in good order, and ſeemed like a forreſt which marched upon the Sea. I ſaw a thing alſo whereat I marvelled much, which was, that the bullets of great peeces made great rebound's, and grazed upon the water as upon the ground. Now to make the matter ſhort, the Engliſh did us no harm, and returned whole and ſound into England, and left us in peace. Wee ſtai'd in that Conntrie in garriſon, till wee were aſſured that their Armie was diſperſed. In the mean time our horſ-men exerciſed their feats of activitie; as to run at the ring, fight in duel, and others, ſo that there was ſtill ſomthing to emploie mee withal. Monſieur *de Eſtampes*, to make ſport and pleaſure to ſaid Monſieur *de Roban*, and *Laval*, and other gentlemen, cauſſed diverſ Countrie wenches, to com to the feaſts, to ſing ſongs in the Low *Braitain* tongue, where their harmonie was like the croaking of Frogs, while they are in love. Moreover made them dance the *Britanie Triorie*, without moving feet or Buttocks, hee made them hear and ſee much good. Otherwhiles they cauſſed the Wraſtlers of the Citties, and Towns, to com where there was a Prize for the beſt, and ſport was ſeldom ended, but that one or other had a leg or arm broken, or the ſhoulder or hip diſplaced: there was a little man of Low *Britanie* of a ſquare bodie and well ſet, who held a long time the credit of the field, and, by his skill and ſtrength, threw five or ſix to the ground; there came to him a great ſchool-maſter, who was ſaid to bee one of the beſt Wraſtlers of all *Britanie*: hee entred into the liſts, having taken off his long jacket, in hoſe and doublet, and beeing neer the little man, hee ſeemed as if hee had been tied to his girdle. Notwithſtanding when each of them took hold of the collar, they were a long time without doing anie thing, and they thought they would remain equal in force and skill: but the little man caſt himſelf with an ambling leap under this great Pedant, and took him on his ſhoulder, and caſt him on his kidnies ſpread abroad like a frog, and then all the companie laugh't at the skill and ſtrength of the little fellow. This great *Dativo* had a great ſpight, for beeing caſt by ſo little a man: hee roſe again in choler, and would have his revenge. They took hold again of each other's collar, and were again a good while at their hold without falling to the ground: in the end this great man let himſelf

Dances of the Countrie wenches.

Wraſtlers little *Britain* a good wraſtler.

The little Britain kil'd. himſelf fall upon the little, and in falling put his elbow upon the pitch of his ſtomach, and burſt his heart, and kil'd him ſtark dead. And knowing hee had given him his death's blow, took again his long caſſock, and went away with his tail between his legs and hid himſelf, ſeeing that the little man came not again to himſelf, either for wine, vineger, or anie other thing that was preſented unto him; I drew near to him, and felt his pulſ which did not beat at all, then I ſaid hee was dead: then the *Britans* who aſſiſted the wraſtling ſaid aloud in their jabberring, that is not in the ſport. And ſom ſaid that the ſaid Pedagoge was accuſtomed to do ſo, and that but a year paſſed hee had don the like in a Wraſtling. I would need's open the bodie to know the cauſ of this ſudden death, where I found much blood in the *Thorax* and in the inferior bellie, and I ſtrived to finde out anie apertion in the place, from whence might iſſue ſo great a quantitie of blood, which I could not do for all the diligence I could make. Now I beleev it was *per Diapedeſin* or *Anaſtomoſin*; that is to ſaie, by the apertion of the mouths of the veſſels, or by their poroſities; the poor little Wraſtler was buried. I took leav of *Meſſieurs de Roban, de Laval*, and *Eſtamps*. Monſieur *de Roban*, gave mee a preſent of fiftie double duckets, and an ambling-horſ, and Monſieur *de Laval* another for my man, and Monſieur *de Eſtamps*, a Diamond of thirtie Crowns, and ſo I returned to my houſ at *Paris*.

The bodie opened by the Autor.

The Voiage of Parpignan, 1543. A Little while after Monſieur *de Roban* took mee with him poſte, to the camp of *Parpignan*; beeing there, the enemie made a Sallie forth, and came and incloſed three pieces of our Artillerie, where they were beaten back to the gates of the citie: which was not don without hurting and killing manie, and amongſt the reſt *de Briſſac*, (who was then chief maſter of the Artillerie) received a muſket ſhot upon the ſhoulder: returning to his Tent, all the others that were hurt followed him, hoping to bee dreſt by the Surgeons, that ought to dreſs them. Beeing com to his Tent and laid on his bed, the bullet was ſearched for by three or four the moſt expert Surgeons of the Armie, who could not finde it, but ſaid it was entred into his bodie.

Addreſs of the Autor. In the end hee called for mee, to ſee if I were more skilful then them, becauſ hee had known mee before in *Piedmount*: by and by I made him riſe from his bed, and praied him to put his bodie into that poſture as it was then when hee received his hurt; which hee did, taking a javelin between his hands as hee held the Pike in the skirmiſh. I put my hand about the wound, and found the bullet in the fleſh, making a little tumor under the *Omoplate*: having found it I ſhewed them the place where it was, and it was taken out by Maſter *Nicolas Lavernaut* Surgeon to Monſieur the *Dolphin*, who was the King's Lievtenant in that armie, yet notwithſtanding the honor remained to mee for findeing it.

Hiſtorie. I ſaw one thing of great remark, which is this: That a ſouldier in my preſence gave to one of his fellows a ſtroke with an Halbard upon the head, penetrating even to the left ventricle of the brain, without falling to the ground. Hee that ſtroke him ſaid, Hee had heard that hee had cheated at dice, and that hee had drawn a great ſum of monie, and that it was his cuſtom to cheat; I was called to dreſs him, which I did as it were for the laſt, knowing well that hee would quickly die: having dreſt him hee returned all alone to his lodging, which was at leaſt two hundred paces diſtant: I bid one of his companions ſend for a Prieſt to diſpoſe of the affairs of his ſoul; hee help't him to one who ſtaid with him to the laſt gaſp. The next daie the patient ſent for mee by his ſhee-friend in a boie's apparel to com to dreſs him, which I would not do, fearing hee ſhould die under my hands; and to put it off, I ſaid I muſt not take of the dreſſing till the third daie, by reaſon hee would die though hee were never touched. The third daie hee came ſtaggering, and found mee in my Tent accompanied with his wench, and praied mee moſt affectionately to dreſs him: And ſhewed mee a purſ wherein hee had an hundred or ſixſcore pieces of gold, and that hee would content mee to my deſire; for all that, yet notwithſtanding I left not off to defer the taking off his dreſſing, fearing leſt hee ſhould die at the ſame inſtant. Certain gentlemen deſired mee to go dreſs him, which I did at their requeſt, but in dreſſing him hee died under my hands in a Convulſion. Now this Prieſt accompanied him until death, who ſeazed upon the purſ leſt another ſhould take it, ſaying, Hee would ſaie Maſſes for his ſoul. Moreover hee furniſht himſelf with his cloaths, and with all the reſt of his things. I have recited this Hiſtorie as a monſtrous thing, that the Souldier fell not to ground when hee had received this great ſtroke, and was in good ſenſes even till death. Soon after, the Camp was broken for divers cauſſes; the one, becauſ wee were advertiſed that four companies of *Spaniards* were entred into *Parpignan*; the other, that the plague begun much in our camp; and it was told us by the people of the countrie, that ſhortly there would bee a great over-flowing of the Sea, which might drown us all; and the preſage which they had, was a verie great winde from Sea, which aroſe in ſuch manner that there remained not one Tent which was not broken and overthrown, for all the ſtrength and diligence that could bee given; and the Kitchins beeing all uncovered, the winde raiſed ſo the duſt and ſand, which ſalted and poudered our meat in ſuch ſort, that wee could not eat it, ſo that wee were conſtrained to boil it in pots and other veſſels well covered.

Now wee did not un-camp our ſelvs in ſo good time, but that there were many Carts and Carters Mules, and Mule-drivers drowned in the Sea, with great loſs of baggage. The Camp broken, I returned to *Paris*.

The Voiage to Landreſy, 1544. KIng *Francis* raiſed a great Armie to victual *Landreſy*: on the other ſide, the Emperor had no leſs people, yea much more; that is to ſaie, eighteen thouſand *Germans*, ten thouſand *Spaniards*, ſix thouſand *Wallons*, ten thouſand *Engliſh*, and a matter of thirteen or fourteen thouſand Horſ. I ſaw the two Armies near one another, within Cannon-ſhot, and it was thought they would never part without giving battel. There were ſom certain fooliſh gentlemen who would approach the enemie's Camp; certain ſhot was made at them, and ſom died at the place, others had their legs or arms carried away. The King having don what hee deſired, which was to victual *Landreſy*, retired

tired himſelf with his armie to *Guiſe*, which was the daie after *All-Saints*, one thouſand five hundred fortie four, and from thence I returned to *Paris*.

The Voiage of Boulogne. 1545

A Little while after wee went to *Boulogne*, where the Engliſh ſeeing our Armie, left the Forts which they had, that is to ſaie, *Moulambert*; the little Paradiſe, *Monplaiſir*, the fort of *Shatillon*, the *Portet*, the fort *Dardelot*. One daie going through the Camp to dreſs my hurt people, the enemies who were in the Tower of *Order*, ſhot off a piece of Ordnance, thinking to kill horſmen which ſtai'd to talk one with another. It happened that the bullet paſſed verie near one of them, which threw him to the ground, and 'twas thought the ſaid bullet had toucht him, which it did not at all, but onely the winde of the ſaid bullet in the mid'ſt of his coat, which went with ſuch a force that all the outward part of the thigh became black and blue, and had much ado to ſtand. I dreſt him, and made him divers Scarifications to evacuate the contuſed blood, which the winde of the ſaid bullet had made; & the rebounds that it made on the ground, kil'd four ſouldiers which remained dead in the place. I was not far from this ſtroke, ſo that I felt ſomwhat the moved air, without doing mee anie harm, then a little fear which made mee ſtoop my head verie low, but the bullet was alreadie paſſed far beyond mee.

The Souldiers mockt mee to bee afraid of a bullet alreadie gon. (My little Maſter) I think if you had been there, that I had not been afraid alone, and that you would have had your ſhare of it. What ſhall I ſaie more? Monſieur the Duke of *Guiſe*, *Francis* of *Lorrain*, was hurt before *Bullogne* with a ſtroke of a Lance, which above the right eie, declining towards the noſe, entered and paſſed quite through on the other between the *nucha* and the ear, with ſo great a violence, that the head of the Lance with a great part of the wood was broken and remained within, in ſuch ſort that it could not bee drawn out but with great force, yea, with Smith's pincers. Notwithſtanding all this violence which was not don without breaking of bones, nervs, and arteries, and other parts; my Said Lord, by the help of God, was cured: the Said Lord went alwaies with open face, which was the cauſ that the Lance went through on the other ſide.

The hurt of Monſieur de Guiſe.

The Voiage of Germanie. 1552.

I Went the Voiage to *Germanie* in the year 1552. with Monſieur *de Roban* Captain of fiftie horſ, where I was Surgeon of his companie, which I have ſaid alreadie. In this voiage Monſieur the high Conſtable of *France* was General of the Armie: Monſieur *de Chaſtillon*, ſince Admiral, was chief Colonel of the Foot, having four Regiments of Lanſquenets, under the Conduct of theſe Captains, *Recrod* and *Ringrave*, having each of them two Regiments, each Regiment was of ten Enſigns, and each Enſign of five hundred men. And beſides theſe, was Captain *Chartel*, who conducted the troops that the Proteſtant-Princes had ſent to the King. This was a verie companie on foot, accompanied with fifteen hundred Horſ, with the following of each one two Archers, which might make four thouſand and five hundred Horſ, beſides two thouſand Light horſ, and as manie musketeers on horſ-back, of whom Monſieur *de Aumalle* was General, beſides the great number of Nobilitie who came for their pleaſure. Moreover, the King was accompanied with two hundred Gentlemen of his houſ, and likewiſe with divers Princes; there was alſo for his troop that ſerved him, the *French*, *Scottiſh*, and *Swiſſers* Guards, amounting to ſix hundred men on foot, and the Companies of Monſieur the *Dolphin*, *Meſſieres de Guiſe*, *de Aumalle*, and of the Marſhal of Saint *Andrew*, which amounted to four hundred Lances, which was a marvellous thing to ſee ſuch a fair Companie; and in this equipage the King entered into *Thou* and *Mets*. I will not omit to tell that it was ordained, that the Companions of *Meſſieres de Roban*, of the Count of *Sancerr*, of *Iarnac*, which was each of them of fiftie horſ, went by the Wings of the Camp; and God know's wee had ſcarcitie of victuals, and I proteſt to God, that at three divers times I had thought I ſhould have been famiſht, and it was not for want of monie, for I had enough, and wee could not have victuals but by force, by reaſon that the *Peſants* withdrew it all into the Cities and Caſtles.

One of the ſervants of a Captain of the companie of Monſieur *de Roban*, went with others thinking to enter into a Church where the *Peſants* were retired, thinking to finde victuals by force or love: but amongſt the reſt this man was well beaten, and returned with ſeven wounds, with a ſword in the head; the leaſt of which penetrated the ſecond table of the ſcull, and hee had four other upon the arms, and upon the right ſhoulder, which cut more then one half of the blade-bone, or *Omoplate*. Hee was brought back to his maſter's lodging, who ſeeing of him ſo wounded, and they were to depart thence the morrow after at the break of daie, and not thinking ever hee could bee cured, made him a grave, and would have caſt him therein, ſaying that, or elſ the *Peſants* would maſſacre and kill him; I mov'd with pittie, told him, that hee might bee cured if hee were well dreſt: divers Gentlemen of the companie praied him that hee would cauſ him to bee brought along with the Baggage, ſeeing I had the willingneſs to dreſs him; to which hee agreed, and after that I had cloth'd him, hee was put up into a cart upon a bed well covered and well accommodated, which one horſ did draw. I did the office of a Phyſician, Apothecarie, Surgeon, and Cook; I dreſt him even to the end of his cure, and God cured him, in ſo much that all theſe three Companies admired at this cure. The horſ-men of the companie of Monſieur *de Roban*, the firſt muſter that was made, gave mee each one, one Crown, and the Archers half a Crown.

The Voiage of Danvilliers. 1552.

AT the return from the *German* Camp, King *Henrie* beſieged *Danvilliers*, thoſe within would not render. They were well beaten, and our powder failed us, in the mean time they ſhot much at our people. There was a Culverin-ſhot paſſed a traverſ the Tent of Monſieur *de Roban*, vvhich hit a Gentleman's Leg, vvhich vvas of his train; vvhich I vvas fain to finiſh the cutting off, the vvhich vvas don vvithout applying hot irons.

Another Hiſtorie.

The King ſent for povvder to *Sedan*, vvhich beeing com, they began a greater batterie then before, in ſuch ſort that they made a breach. *Meſſiers de Guiſe*, and the high Conſtable beeing

in

in the King's Chamber, told him they concluded the next daie to make aſſault, and that they were aſſured they ſhould enter into it, and that they ſhould keep it ſecret leſt the enemie were advertiſed. And all of them promiſed not to ſpeak of it to anie one. Now there was a groom of the King's chamber who laie nnder the King's bed in the Camp to ſleep, underſtood that they reſolved the next daie to give an aſſault, hee preſently revealed it to a certain Captain, and told him that for certain, the daie following aſſault ſhould bee given, and that hee had heard it of the King, and praied the ſaid Captain that hee would not ſpeak a word of it to anie bodie, which hee promiſed; but his promiſe was not kept, for at the ſame inſtant, hee went and declared it to a Captain, and this Captain to another Captain, and from the Captains to ſom of the ſouldiers, ſaying alwaies, ſaie nothing. It was ſo well hid that the next daie early in the morning, there was ſeen the greateſt part of the Souldiers with their round hoſe and their breeches cut at knee for the better mounting at the breach. The King was advertiſed of the rumor which run through the Camp, that the aſſault muſt bee given, whereof hee much marvelled, ſeeing there were but three of that adviſe, which had promiſed one to another, not to tell it to anie one. The King ſent for Monſieur *de Guiſe*, to know if hee had not talked of this aſſault; hee ſwore and affirmed to him hee had not told it to anie bodie; and Monſieur the Conſtable ſaid as much; who ſaid to the King, hee muſt expreſsly know who had declared this ſetret Counſel; ſeeing they were but three. Inquiſition was made from Captain to Captain, in the end the truth was found; for one ſaid 'twas ſuch a one told mee, another ſaid as much, till at length they came to the firſt, who declared hee had learned it of a Groom of the King's-Chamber, named *Guyard*, born at *Blois*, the ſon of the deceaſed King *Francis* his Barber. The King ſent for him into his Tent, in the preſence of Monſieur *de Guiſe*, and of Monſieur the Conſtable, to underſtand from him whence hee had it, and who told him that this aſſault was to bee given. The King told him, that if hee did not tell the truth, that hee would cauſ him to bee hanged; then hee declared, hee laie down under his bed thinking to ſleep, and ſo having heard it, hee declared it to a Captain who was a friend of his, to the end hee might prepare himſelf with his Souldiers the firſt for the aſſault. After the King knew the truth; hee told him hee ſhould never ſerv him again, and that hee deſerved to bee hanged, and forbid him ever to com again to the Court. My Groom of the Chamber went away with this ſad news, and laie with one of the King's Surgeons in Ordinarie, named Maſter *Lewis*, and in the night gave himſelf ſix wounds with a knife, and cut his throat; yet the ſaid Surgeon perceived nothing till morning, till hee ſaw the bed bloodie, and the dead bodie by him: hee much marvelled at this ſpectacle upon his waking, and was afraid leſt they ſhould ſaie hee was the cauſ of this murther; but was ſoon free'd, knowing the cauſ to bee from deſperation, having loſt the good amitie which the King bore to him. The ſaid *Guyard* was buried. And thoſe of *Danvilliers* when they ſaw the breach large enough for them to enter in, and the Souldiers prepared for the aſſault, yeelded themſelvs to the mercie of the King. The chief of them were priſoners, and the Souldiers ſent away without arms. The Camp beeing broken up I returned to *Paris* with my Gentleman whoſe leg I had cut off, I dreſt him and God cured him; I ſent him to his houſ merrie with his wooden leg, and was content, ſaying that hee eſcaped good cheap, not to have been miſerable burnt, as you write in your book, my little Maſter.

What it is to reveal the ſecrets of Princes.

The Voiage of Caſtle the Compt, 1552. The King of *Navarre* praied the Autor to follow him

A Little while after, King *Henrie* levied an Armie of thirtie thouſand men, to go make ſpoil about *Hedin*. The King of *Navarre* who was then called Monſieur *de Vendoſme*, was chief of the Armie, and the King's Lievtenant. Beeing at S. *Denis* in *France*, ſtaying while the Companies paſſed by, hee ſent for mee to *Paris* to com ſpeak with him; beeing there, hee praied mee, and his requeſt was a command, that I would follow him this Voiage; and I about to make my excuſe, told him my wife was ſick in her bed; hee made mee anſwer, That there were Phyſicians at *Paris* for to cure her; and that hee as well left his own, who was as well deſcended as mine; promiſing mee that hee would uſe mee well, and forthwith gave command that I ſhould bee lodged as one of his Train. Seeing this great affection, which hee had to lead mee with him, I durſt not refuſe him. I went and met with him at the Caſtle of *Compt*, within three or four leagues of *Hedin*, there where there was the Emperor's Souldiers in garriſon with a number of *Peſſants* round about: hee cauſſed them to bee ſummoned to render themſelvs; and they made anſwer they ſhould never have them but by pieces, and let them do their worſt, and they would do their beſt to defend themſelvs. They put confidence in their ditches full of water, and in two hours with a great number of Bavins, and certain emptie Casks, waie was made to paſs over the Foot: when they muſt go to the aſſault and were beaten with five pieces of Cannon, till a breach was made large enough to enter in, where they within received the aſſault verie valiantly, and not without killing and hurting a great number of our people with musket-ſhot, pikes, and ſtones. In the end when they ſaw themſelvs conſtreined, they put fire to their powder and munition, which was the cauſ of burning manie of our people, and their's likewiſe, and they were all almoſt put to the ſword. Notwithſtanding ſom of our Souldiers had taken twentie or thirtie, hoping to have ranſom for them. That was known, and ordered by the Counſel, that it ſhould bee proclamed by the Trumpet through the Camp, that all Souldiers who had anie *Spaniards* priſoners, were to kill them, upon pain to bee hanged and ſtrangled, which was don upon cold blood. From thence wee went and burnt divers Villages, whoſe barns were full of all kinde of grain, to my great grief. Wee went along even to *Tournahan*, where there was a verie great Tower where the Enemies retired, but there was no man found in it, all was pillaged, and the Tower was made to leap by a Mine, and then with gun-powder turned topſie-turvie. After that, the Camp was broken up, and I returned to *Paris*. I will not yet forget to write that the daie after the Caſtle of *Compt* was taken, Monſieur *de Vendoſme* ſent a Gentleman to the King to make report to him

Hiſtorie of deſperate people.

The taking of Caſtle of Compt.

him of all which had passed, and amongst other things, told the King that I had greatly don my dutie in dressing those that were wounded, and that I had shewed him eighteen bullets which I had taken or drawn out of the hurt bodies, and that there were divers more which I could neither finde, nor draw out, and told more good of mee then there was by half. Then the King said hee would have mee into his service, and commanded Monsieur *de Goguier* his chief Physician to write mee down as entertained one of his Surgeons in ordinarie, and that I should go meet with him at *Rheimes* within ten or twelv daies; which I did, where hee did mee the honor to command mee that I would dwell near him, and that hee would do mee good. Then I thank'd him most humbly for the honor it pleased him to do mee, in calling mee to his service.

The Voiage of Mets, 1552. The names of the Princes who were at the siege of Mets.

THe Emperor having besieged *Mets*, and in the hardest time of winter, as each one know's of fresh memorie: and that there was in the Cittie five or six thousand men, and amongst the rest seven Princes; that is to saie, Monsieur the Duke of *Guise* the King's Lievtenant, *Messieurs d' Anguien, de Conde, de Montpensier, de La Roch upon Yon*, Monsieur *de Nemours*, and divers other Gentlemen, with a number of old Captains of War, who often made sallies forth upon the enemies, (as wee shall speak of hereafter) which was not don without slaying manie, as well on the one side as the other. For the most part all our wounded people died, and it was thought the medicaments, wherewith they were dressed, were poisoned; which caussed Monsieur *de Guise* and other Princes to send to the King for mee, and that hee would send mee with Drogues to them, for they beleeved their's were poisoned, seeing that of their hurt people few escaped. I do not beleev there was anie poison, but the great strokes of the Cutlasses, musket-shot, and the extremitie of cold was the cause. The King caussed one to write to Monsieur the Marshal of S. *Andrew* which was his Lievtenant at *Verdun*, that hee found som means to make mee enter into *Mets*. The said Lord Marshal of S. *Andrew* and Monsieur the Marshal of old *Ville*, got an *Italian* Captain, who promised them to make mee enter in, which hee did, and for which hee had fifteen hundred Crowns: the King having heard of the promise which the *Italian* Captain had made, sent for mee, and commanded mee to take of his Apothecarie named *Daigue*, such, and as manie Drogues as I should think fit for the hurt who were besieged, which I did, as much as a post-horse could carrie. The King gave mee charge to speak to Monsieur *de Guise*, and to the Princes, and Captains who were at *Mets*. Beeing arrived at *Verdun*, a few daies after the Monsieur the Marshal of S. *Andrew*, caussed horses to bee given to mee, and my man, and for the *Italian*, who spake verie good high *Dutch*, *Spanish*, and *Wallon*, with his own natural tongue. When wee were within eight or ten Leagues of *Mets*, wee went not but in the night, and beeing near the Camp, I saw a league and a half off bright fires about the Cittie, which seemed as if all the earth were on fire, and I thought wee could never pass through those fires without beeing discovered, and by consequent bee hanged and strangled, or cut in pieces, or paie a great ransom. To speak truth, I wished my self at *Paris*, for the imminent danger which I fore-saw. God guided so well our affairs that wee entred into the Cittie at midnight with a certain Token, which the Captain had with another Captain of the companie of Monsieur *de Guise*: which Lord I went to, and found him in bed, who received mee with great thanks, beeing joiful of my comming. I did my message to him of all that the King had commanded mee to saie to him; I told him I had a little letter to give to him, and that the next daie I would not fail to deliver it him. That don, hee commanded mee a good lodging, and that I should bee well used, and bid mee I should not fail to bee the next daie upon the Breach, where I should meet with all the Princes, and divers Captains, which I did; who received mee with great joie, who did mee the honor to imbrace mee, and tell mee I was verie welcom, adding withal, they did not fear to die if they should chance to bee hurt. Monsieur *de la Roch upon Yon* was the first that feasted mee, and inquired of mee what they said at the Court concerning the Cittie of *Mets*: I told him what I thought good. Then presently hee desired mee to go see one of his Gentlemen, named Monsieur *de Magnané*, at this present Knight of the King's Order, and Lievtenant of his Majestie's Guard; who had his leg broken by a Cannon-shot. I found him in his bed, his leg bended and crooked, without anie dressing upon it; becaus a Gentleman promised him cure, having his name, and his girdle, with certain words. The poor Gentleman wept, and cried with pain which hee felt, not sleeping either night or daie, in four daies: then I mock't at this imposture and false promise. Presently I did so nimbly restore and dress his Leg, that hee was without pain and slept all night, and since (thanks bee to God) was cured, and is yet at this present living, doing service to the King. The said Lord of the *Roch upon Yon* sent mee a tun of wine to my lodging, and bid tell mee, when it was drunken hee would send mee another. That don, Monsieur *de Guise* gave mee a list of certain Captains and Lords, and commanded mee to tell them what the King had given Mee in charge; which I did, which was to do his commendations and a thanksgiving for the dutie they had don, and did in the keeping of the Cittie of *Mets*, and that hee would acknowledg it. I was more then eight daies in acquitting my charge, becaus they were manie; first to the Princes and others; as the Duke of *Horace*, the Count of *Martigues*, and his brother, Monsieur *de Bauge*, the Lords *Montmorancy*, and *d'Anville*, then Marshal of *France*, Monsieur *de La Chapel*, *Bonnivet Carong* novv Governor of *Rohan*, the *Vadasme* of *Chartres*, the Count of *Lude*, Monsieur *de Biron* novv Marshal of *France*; Monsieur *de Randan* the *Rochfoucaut*, *Boxdaille d'Errez*, the younger, Monsieur *de S. John* in *Dolphiny*, and manie others which it vvould bee too long to recite; and chiefly to divers Captains vvho had verie vvell don their dutie in defens of their lives and Cittie. I demanded aftervvards of Monsieur *de Guise*, vvhat it pleased I should do vvith the Drogues vvhich I had brought, hee bid mee impart them to the Surgeons and Apothecaries, and chiefly to the poor hurt Souldiers in the Hospital vvhich vvere in great number; vvhich I did, and can assure you, I could not do so much as go and see them, but they

Nota.

Commission of the Autor.

History.

sent

sent for mee to visit and dress them. All the besieged Lords praied mee carefully to sollicite above all others Monsieur *de Pienne* who was hurt at the breach by a stone raised by a Cannon-shot in the Temple with a fracture, and depressing of the bone. They told mee that presently when hee received the stroak, hee fell to the earth as dead, and cast blood out of his mouth, nose, and ears with great vomitings, and was fourteen daies without speaking one word, or having anie reason; there happened to him also startings somwhat like Convulsions, and had all his face swell'd and livid. Hee was trepan'd on the side of the temporal muscle upon the *Os Coronale*. I dress him with other Surgeons, and God cured him; and is at this daie living, God bee thanked. The Emperor caussed batterie to bee made with fortie double Cannons, where they spared no powder night nor daie. Presently when Monsieur *de Guise* saw the Artillerie seated to make a breach, hee made the neareſt houses to bee pulled down to make Ramparts, and the posts and beams were ranged end to end, and between two clods of earth, beds and packs of wool, and then other posts and beams were put again upon them as before. Now much wood of the houses of the Suburbs, which had been put to the ground for fear lest the enemie should bee lodged, close covered, and that they should not help themselvs with anie wood) served well to repair the Breach. Everie one was busied to carried earth to make the Ramparts night and daie. *Messieres* the Princes, Lords and Captains, Lievtenants, Ensigns, did all carrie the Baskets, to give example to the Souldiers and Citizens to do the like; which they did: yea, both Ladies and Gentlewomen, and those which had not baskets, helpt themselvs with kettles, panniars, sacks, sheets, and with what elſ they could to carrie earth; in so much that the enemie had no sooner beaten down the Wall, but hee found behinde it a Rampart more strong. The Wall beeing faln, our Souldiers cried to those without, the Fox, the Fox, the Fox, and spake a thousand injuries one to another. Monsieur *de Guise* commanded upon pain of death that no man should speak to them without, for fear lest there should bee som Traitor who would give them intelligence what was don in the Cittie; the command made, they tied living Cats at the end of their Pikes, and put them upon the Wall, and cried with the Cats, miau, miau.

The hurt of Monsieur *de Pienne*, trepan'd and cured.

Princes carried the Baskets.

Truly the Emperialists were verie much vexed to have been so long making a Breach, and at so great expens, which was the breach of fourscore steps, to enter fortie men in front, where they found a Rampart more strong then the wall; they fell upon the poor Cats and shot at them with their muskets as they use to do at birds. Our people did oftentimes make sallies by the command of Monsieur *de Guise*. The daie before there was a great press to make themselvs enrowled, who must make the sallie, chiefly of the young Nobilitie, lead by well experimented Captains. Insomuch that it was a great favor to permit them to sallie forth and run upon the enemie: and they sallied forth alwaies the number of one hundred, or fixscore armed men with Cutlasses, Muskets, Pistols, Pikes, Partisans and Halberds, which went even to their trenches to awaken them. Where they presently made an alarum throughout all their Camp, and their Drums sounded, plan, plan, ta ti, ta, ta, ta, ti, ta, tou, touf, touf: likewise their Trumpets and Cornets sounded, to the saddle, to the saddle, to the saddle, to horſ, to horſ, to horſ, to the saddle, to horſ. And all their souldiers cri'd, Arm, arm, arm, to arms, to arms, to arms, arm, to arms, arm, to arms, arm to arms, like the crie after Wolvs, and all divers tongues, according to their Nations: and they were seen to go out from their tents, and little lodgings, as thick as little Bees, when their hive is discovered; to succor their fellows, who had their throats cut like sheep. The horſ-men likewise came from all parts, a great gallop, patati, patata, patati, patata, ta, ta, patata, patata, and tarried well, that they might not bee in the throng, where stroaks were imparted to give and receiv. And when our men saw they were forced, they returned into the Citie, still fighting, and those who run after were beaten back with the Artillerie which they had charged with flint-stones, and four-square pieces of iron; and our souldiers who were upon the said Wall made a vollie of shot, and showred down their bullets upon them like hail, to send them back to their lodging, where divers remained in the place of the combat, and also our men did not all com with whole skins, and there still remained som for the Tithe, who were joiful to die in the bed of honor. And where there was a horſ hurt, hee was flaied, and eaten by the Souldiers in stead of beef and Bacon, and it was fit I must run to dress our hurt men. A few daies after other sallies were made, which did much anger the enemies, becaus they did not let them sleep but little in safetie. Monsieur *de Guise*, made a war-like stratagem, which was, Hee sent a Pesant who was none of the wiseſt with two pair of letters toward the King, to whom hee gave ten Crowns, and promised the King should give him an hundred, provided hee gave him the letters. In the one, hee sent word that the enemie made no sign of retiring himself, and by all force made a great Breach, which hee hoped to defend, yea, to the losing of his life, and of all those that were within; and that the enemie had so well placed his Artillerie in a certain place which hee named, that with great difficultie was it kept that they had not entered into it, seeing it was a place the most weak of all the Cittie: but hee hoped quickly to fill it up again in such sort, that they cannot bee able to enter. One of these Letters was sewed in the lining of his doublet, and hee was bid to take heed that hee told it not to anie man. And there was also another given to him; wherein the said Monsieur *de Guise* sent word to the King, that hee and all the besieged did hope well to keep the Citie, and other matters which I ceas to speak of. They made the Pesant go forth in the night, and presently after hee was taken by one that stood Sentinel, and carried to the Duke of *Albe*, to understand what was don in the Cittie, and they asked him if hee had anie letters, hee said, yes, and gave them one; and having seen it, hee was put to his oath, whether hee had anie other, and hee swore, not; then they felt and search't him, and found that which was sewed to his doublet, and the poor messenger was hanged.

Breach.

The said letters were communicated to the Emperor, who caussed his counsel to bee called there, where

it was resolved, since they could do nothing at the first breach, that presently the Artillerie should bee drawn to the place which they thought the most weak, where they made great attempts to make another breach, and dig'd and undermined the wall, and endevoured to take the Tower of Hell, yet they durst not com to the assault. The Duke of *Albe* declared to the Emperor that the souldiers died daily, yet more then the number of two hundred, and that there was but little hope to enter into the Citie, seeing the season, and the great quantitie of Souldiers that were there. The Emperor demanded what people they were that died, and if that they were gentlemen of remark or qualitie: answer was made, that they were all poor souldiers; then said hee, It make's no matter if they die, comparing them to caterpillers and grashoppers, which eat the buds of the earth. And if they were of anie fashion, they would not bee in the Camp for twelv shillings the month, and therefore no great harm if they died. Moreover hee said, Hee would never part from before that Cittie, till hee had taken it by force or famine, although hee should lose all his Armie; by reason of the great number of Princes which were therein, with the most part of the Nobilitie of *France*. From whom hee hoped to draw double his expens, and that hee would go once again to *Paris*, to visit the Parisiens, and make himself King of all the Kingdom of *France*. Monsieur *de Guise* with the Princes, Captains, and Souldiers, and generally all the Citizens of the Cittie, having understood the intention of the Emperor, which was to extirpate us all, they advised of all they had to do: And since it was not permitted to the Souldiers, nor Citizens, no nor to the Princes, nor Lords themselvs to eat either fresh-fish, or venison, as likewise som partridges, woodcocks, larks, plovers, for fear lest they had gathered som pestilential air which might give us anie contagion; but that they should content themselvs with the ammunition-fare; that is to saie, with bisquet, Beef, poudered-cows, lard, and gammons of bacon: Likewise fish; as green-fish, salmon, sturgeon, anchovies, pilchers and herrings, also peas, beans, rise, garlike, onions, prunes, cheese, butter, oil, salt, pepper, ginger, nutmegs, and other Spiceries to put into pies, chiefly to horse-flesh, which without that would have had a verie ill taste; divers Cittizens having gardens in the Cittie sowed therein great Raddishes, Turnips, Carrots, and Leeks, which they kept well and full dear, against the extremitie of hunger. Now all these ammunition-victuals were distributed by weight, measure, and justice, according to the qualitie of the person, becaus wee knew not how long the siege would last. For having understood from the mouth of the Emperor, that hee would never part from before *Mets*, till hee had taken it by force or famine; the victuals were lessened, for that which was wont to bee distributed to three, was now shared amongst four, and defens made they should not sell what remained after their dinner, but 'twas permitted to give it to the wenches that followed the Camp, And rose alwaies from table with an appetite, for fear they should bee subject to take Physick. And, before wee would yeeld our selvs to the mercie of our enemies, had resolved to eat our Asses, Mules, Horses, Dogs, Cats and Rats; yea, our boots and other skins which wee could soften and frie. All the besieged did generally resolv to defend themselvs with all sorts of Instruments of War; that is to saie, To rank, and charge the Artillerie, at the entrie of the Breach, with bullets, stones, cart-nails, bars, and chains of iron. Also all kindes and differences of artificial Fire; as Boertes, Barriquado's, Granado's, Ports, Lances, Torches, Squibs, burning-faggots. Moreover, scalding-water, melted-lead, powder of unquenched lime to blinde their eies. Also they were resolved to have made holes through and through their houses, there to lodg musketeers, there to batter in the flank and hasten them to go, or elss make them lie for altogether. Also there was order given to the women to unpave the streets, and to cast them out at their windows, billets, tables, tresles, forms, and stools, which would have troubled their brains: moreover, there was a little further, a strong Court of Guard, fil'd with carts and pallisado's, pipes and hogsheads fil'd with earth for barriquado's to serv to interlaie with faulcons, faulconets, field-pieces, harquibuzes, muskets, and pistols, and wilde-fire, which would have broken legs and thighs, insomuch that they had been beaten in head, in flank, and in tail; and where they had forced this Court of Guard, there was others at the crosling of the streets, each distant an hundred paces, who had been as bad companions as the first, and would not have been without making a great manie Widdows and Orphans. And if fortune would have been so much against us, as to have broken our Courts of Guard, there was yet seven great Bastallions ordered in square, and triangle, to combate altogether, each one accompanied with a Prince to give them boldness, and encourage them to fight, even till the last gasp, and to die altogether. Moreover it was resolved, that each one should carrie his treasure, rings and jewels, and their household-stuff of the best, to burn them in the great place, and to put them into ashes rather then the enemie should prevail, and make Trophies of their spoils; likewise there was people appointed to put fire to the munition, and to beat out the heads of the Wine-cask, others to put the fire in each hous, to burn our enemies and us together: The Cittizens had accorded it thus, rather then to see the bloodie knife upon their throat, and their Wives and Daughters violated, and to bee taken by force, by the cruel and inhumane *Spaniards*. Now wee had certain prisoners which Monsieur *de Guise* sent away upon their faith, to whom was secretly imparted our last resolution, will, and desperate mindes; who beeing arrived in their Camp, do not defer the publishing; which bridled the great impetuositie, and will of the souldiers to enter anie more into the Cittie to cut our throats, and to enrich themselves of our pillags. The Emperor having understood this deliberation of the great Warriour, the Duke of *Guise* put water in his wine, and restreined his great choler and furie, saying, Hee could not enter into the Cittie without making a great slaughter and butcherie, and spill much blood, as well of the defendents, as of the assailants, and that they should bee dead together, and in the end could have nothing elss but a few ashes, and that afterward it might bee spoken of that, as of the destruction *Jerusalem* alreadie made by *Titus* & *Vespatian*. The Emperor then having understood our last resolution, & seeing their

little

little prevailing by their batterie and undermining, and the great plague which was in his whole armie, and the indiſpoſition of the time, and the want of victuals and monie, and that his ſouldiers forſook him, and went away in great companies; concluded in the end to retire themſelvs accompanied with the Cavallerie of his Vantgard, with the greateſt part of his Artillerie, and the Battalia: The Marqueſs of *Brandeborg* was the laſt which uncampt, mainteined by certain bands of *Spaniards*, *Bohemians*, and his *Germane* companies, and there remained one daie and a half after, to the great grief of Monſieur *de Guiſe*, who cauſſed four pieces of Artillerie to bee brought out of the Cittie, which hee cauſſed to bee diſcharged at him on one ſide; and the other to haſten them to bee gon, which hee did full quickly, with all his Troops. Hee beeing a quarter of a league from *Mets* was taken with a fear leſt our Cavallerie ſhould fall upon him in the Rere, which cauſſed him to put fire to his munition-powder, and leav certain pieces of Artillerie, and much baggage which hee could not carrie, becauſ the Vantgard, and the Battalia, and great Cannons had too much broken the waie. Our horſ-men would by all means have gon out of the cittie to have faln upon their breech. But Monſieur *de Guiſe* would never permit them, but on the contrarie wee ſhould rather make plain their waie, and make them bridges of gold and ſilver, and let them go, beeing like to a good ſhepherd, who will not loſe one of his ſheep. See now how our well-beloved Imperialiſts went away from before the Cittie of *Mets*, which was the daie after *Chriſtmas* daie, to the great contentment of the beſieged, and honor of Princes, Captains, and Souldiers, who had endured the travels of this ſiege the ſpace of two months. Notwithſtanding they did not all go, there wanted twentie thouſand who were dead, as well by Artillerie, by the ſword, as alſo by the plague, cold, and hunger, and for ſpight they could not enter into the Cittie to cut our throats, and have the pillage: and alſo a great number of their horſes died, of which they had eaten a great part in ſtead of Beef and Bacon. They went where they had been encamped, where they found divers dead-bodies not yet buried, and the earth all digged like S. *Innocent's* Church-yard in the time of the plague. They did likewiſe leav in their lodgings, pavillions and tents, divers ſick people: alſo bullets, arms, carts, waggons, and other baggage, with a great manie of munition-loavs, ſpoiled and rotten by the rain and ſnow, yet the ſouldiers had it but by weight and meaſure; and likewiſe they left great proviſion of wood, of the remainders of the houſes of the Villages which they had pluckt down two or three miles compaſs, likewiſe divers other houſes of pleaſure belonging to the Citizens, accompanied with fair gardens, graſs-plats fil'd with fruit-trees, for without that they had been ſtarv'd with cold, and had been conſtreined to have rais'd the ſiege ſooner. The Said Monſieur *de Guiſe* cauſſed the dead to bee buried, and dreſs their ſick people; likewiſe the enemies left in the Abbie of S. *Arnoul* divers of their hurt ſouldiers which they could not lead with them: the Said Monſieur *de Guiſe* ſent them all victuals enough, and commanded mee and other Surgeons to go dreſs them and give them medicines; which wee willingly did, and think they would not have don the like toward others (becauſ the *Spaniard* is moſt cruel, perfidious, and inhumane, and therefore enemie to all Nations) which is proved by *Lopez* a *Spaniard*, and *Benzo* of *Milan*, and others who have written the hiſtorie of *America*, and the Weſt-*Indies*, who have been conſtreined to confeſs, that the crueltie, avarice, blaſphemie, and wickedneſs of the *Spaniards*, have altogether alienated the poor *Indians* from the Religion which the Said *Spaniards* are ſaid to hold. And all write, they are leſs worth then the Idolatrous *Indians*, by the cruel uſage don to the ſaid *Indians*.

And a few daies after wee ſent a Trumpet to *Thionville* toward the enemie, that they ſhould ſend back for their wounded men in ſafetie, which they did with Carts and Waggons, but not enough. Monſieur *de Guiſe*, cauſſed them to have Carts and Carters, to help to carrie them to the Said *Thionville*. Our Said Carters beeing returned back, brought us word that the waie was paved with dead bodies, and that they never lead back the half, for they died in their Carts, and the *Spaniards* ſeeing them at the point of death, before they had caſt out their laſt gaſp, caſt them out of their Carts, and buried them in the mud and mire, ſaying, They had no order to bring back the dead. Moreover our Said Carters ſaid, they met by the waie divers Carts loaden with baggage ſticking in the mire, which they durſt not ſend for back, for fear leſt thoſe of *Mets* ſhould fall upon them. I will again return to the cauſ of their mortalitie, which was principally through hunger, plagne, and cold; for the ſnow was two foot thick upon the earth, and they were lodged in the caves of the earth, onely covered with a little ſtraw. Notwithſtanding each Souldier had his field-bed, and a covering ſtrewed with glittering ſtars, more bright then fine gold, and everie daie had white ſheets, and lodged at the ſign of the Moon, and made good cheer when they had it, and pai'd their hoſte ſo well over-night, that in the morning they went away quite, ſhaking their ears, and they needed no comb to take away the doun out of their hairs either of head or beard, and found alwaies a white table-cloth, loſing good meals for want of Victuals. Alſo the greateſt part of them had neither boots, nor buskins, ſlippers, hoſe, or ſhooes, and divers had rather have none then have them, becauſ they were alwaies in mud, half waie of the leg; and becauſ they went bare-leg'd, wee called them the Emperor's Apoſtles. After the Camp was wholly broken, I diſtributed my patients into the hands of the Surgeons of the Cittie, to finiſh their cure: then I took leav of Monſieur *de Guiſe*, who came back toward the King, who received mee with a loving countenance, and demanded of mee how I did enter into the Cittie of *Mets*. I recounted to him all that I had don, hee cauſſed two hundred crowns to bee given mee, and one hundred I had at my going out, and told mee hee would not leav mee poor; then I thanked him moſt humbly for the good and the honor which hee pleaſed to do mee.

The Voiage of Henin. 1553. CHarls the Emperor cauſſed the Cittie of *Therouenne* to bee beſieged, where Monſieur, the Duke of *Savoy*, was General of the whole Armie: it was taken by aſſault where there

was a great number of our men slain and prisoners. The King willing to prevent that the enemie should not also com to besiege the Cittie and Castle of *Hedin*, sent *Messiers* the Duke *Bouillion*, the Duke *Horace*, the Marques of *Villars*, a number of Captains, and about eight hundred souldiers, and during the siege of *Theroienne*, the Said Lords fortified the said Castle of *Hedin*, in such sort that it seemed impregnable. The King sent mee to the Said Lord to help them with my Art, if there were anie need. Now soon after the taking of *Theroienne*, wee were besieged with the Armie: there was a quick clear fountain or Spring, within Cannon-shot, where there was about fourtcore whores, and wenches of the enemies, who were round about it to draw water. I was upon a Rampart beholding the Camp, and seeing so manie idlers about the said fountain, I praied Monneur *de Pont* Commissarie of the Artillerie, to make one Cannon-shot at that roguish companie, hee made mee much denial, answering mee that such kinde of people were not worth the powder they should waste. Again I praied him to level the Cannon, telling of him, the more dead, the fewer enemies; which hee did through my requeast, and at that shot fifteen or sixteen were kil'd, and manie hurt. Our souldiers sallied forth upon the enemies, where there was manie kil'd and slain with musket-shot and swords, as well on the one side, as of the other, and our souldiers did often make sallies forth upon the enemies before their trenches were made; where I had much work cut out, so that I had no rest night nor daie for dressing the wounded. And I will tell this by the waie, that wee had put manie of them in a great Tower, laid upon a little straw, and their pillows were stones, their coverlets were their cloaks, of those that had anie. Whil'st the batterie was making, as manie shot as the Cannons made, the patients said they felt pain in their wounds, as if one had given them blows with a staff, the one cri'd his head, the other his arm, and so of other parts; divers of their wounds bled a fresh, yea in greater quantitie then first when they were wounded, and then it was I must run to staie their bleeding. My little master, if you had been there, you had been much troubled with your hot-irons, you had need to have had much charcoal to make them red hot, and beleev they would have slain you like a Calf for this crueltie. Now through this diabolical tempest of the Eccho from these thundering Instruments, and by the great and vehement agitation of the collision of the air resounding and reverberating in the wounds of the hurt people, divers died, and others becaus they could not rest by reason of the groans and cries that they made night and daie; and also for want of good nourishment, and other good usage necessarie to wounded people. Now my little master, if you had been there you would hardly have given them gellie, restauratives, cullises, pressures, panado, cleansed barlie, white meat, almond-milk, prunes, raisins, and other proper meats for sick people: your ordinance would onely have been accomplisht in paper, but in effect they could have had nothing but old Cow-bief, which was taken about *Hedin* for our munition, salted and half-boiled, in so much that who would have eat it, hee must pull it with the force of his teeth, as birds of Preie do carrion. I will not forget their linnen wherewith they were dress't, which was onely rewashed everie daie, and dried at the fire, and therefore drie and stubborn like Parchment, I leav you to think how their wounds could heal well. There were four lustie whores to whom charge was given to wash their linnen, who discharged their dutie under penaltie of the batoon, and also they wanted both sope and water. See then how the sick people died for want of nourishments, and other necessarie things. One daie our enemies feigned to give us a general assault, to draw our Souldiers upon the breach, to the end, to know our countenance & behaviour: everie one ran thither, wee had made great provision of artificial fire to defend the breach; a Priest belonging to Monsieur *de Bouillon* took a granado, thinking to throw it on the enemies, and set it on fire sooner then it ought to have don: it brake asunder, and the fire fell amongst our fire-works, which were put into a hous near the breach; which was to us a marvellous disaster, becaus it burned divers poor souldiers: it also took hold on the hous it self, and wee had been all burned had not great help been used for to quench it; there was but one Well there wherein was water in our Castle, which was almost quite dried up, and in stead of water wee took beer and quenched it: then afterwards wee had great scarcitie of water, and to drink the rest that remained which wee must strain through napkins.

Now the enemie seeing this smoak and tempest of the fire-works which cast a verie great flame and clashing noise, beleeved wee had put the fire on purpose for the defens of our breach, to burn them, and that wee had great store of others. That made them to bee of another opinion, then to take us by assault; they did undermine, and dig into the greatest part of our walls, so that it was the waie to overthrow wholly the Castle topsie-turvie, and when the mines were finisht, and that their Artillerie shot, the whole Castle did shake under us like an earth-quake, which did much astonish us. Moreover hee had levelled five pieces of Artillerie which they had seated upon a little hill, to plaie upon our backs when wee should go to defend the breach.

The Duke *Horace* had a Cannon-shot upon one shoulder, which carried away his arm on one side and the bodie on the other, without beeing able to speak one onely word. His death was to us a great disaster for the rank vvhich hee held in his place.

Likevvise Monsieur *de Martigues* had a stroak vvith a bullet vvhich pierc't through his Lungs; I dress't him, as I vvill declare hereafter. Then wee demanded Parl, and a Trumpet was sent tovvard the Prince of *Piedmont*, to knovv vvhat composition it pleased him to make us: His answver vvas, that all the chief, as Gentlemen, Captains, Lievtenants, and Ensigns, should bee taken for ransom, and the Souldiers should go out vvithout Arms; and if they refused this fair and honest proffer, the next daie vvee ought to bee assured they vvould have us by assault or othervvise. Counsel vvas held, vvhere I vvas called to knovv if I vvould sign as divers Captains, Gentlemen, and others, that the place should bee rendered up. I made answver it vvas not possible to bee held, and that I vvould sign it vvith my proper blood, for the little hope that I had, that vvee could resist the enemies force, & also for the great desire vvhich I had to bee

out

out of this torment, and hell; for I ſlept not either night or daie, by reaſon of the great number of hurt people, which were about two hundred. The dead bodies yeelded a great putrefaction, beeing heaped one upon the other like fagots, and not beeing covered with earth becauſ wee had it not; and when I entred into one lodging, Souldiers attended mee at the door to go dreſs others at another; when I went forth, there was ſtriving who ſhould have mee, and they carried mee like a holie bodie not touching the ground with my foot in ſpight one of another; nor could I ſatisfie ſo great a number of hurt people. Moreover I had not what was neceſſarie to dreſs them withal; for it is not ſufficient that the Surgeon do his dutie towards the patients, but the patient muſt alſo do his, and the aſſiſtance, and all exterior things; witneſs *Hippocrates* in his firſt *Aphoriſme*. Now having underſtood the reſolution of the yeelding up of our place, I knew our affairs went not well; and for fear of beeing known, I gave a velvet coat, a Satin doublet, a verie fine cloth-cloak lin'd with velvet, to a ſouldier, who gave mee a ſcurvie old torn doublet cut and ſlaſht with uſing, and a leather jerkin well examined, and an ill favored hat, and a little cloak; I ſmutcht the collar of my ſhirt with water in which I had mingled a little ſoot; likewiſe I wore out my ſtockings with a ſtone at the knees and the heels as if they had been worn a long time, and I did as much to my ſhooes, in ſo much, that they would rather take mee for a Chimnie-ſweeper, then a King's Surgeon. I went in this Equipage towards Monſieur *de Martigues*, where I praied him that hee would take order that I might remain near him to dreſs him, which hee agree'd to moſt willingly, and had as much deſire I ſhould remain with him as my ſelf. Soon after, the Commiſſioners, who had charge to elect the priſoners, entred into the Caſtle, the ſeventeenth daie of *Julie* one thouſand five hundred fiftie three, where they made *Meſſieurs* the Duke of *Bouillon*, the Marqueſs of *Villars*, the Baron of *Culan*, Monſieur *du Pont* Commiſſarie of the Artillerie, and Monſieur *de Martigues*, and I to bee taken through the requeſt that hee made to them; and all other Gentlemen which they could perceiv were able to paie anie ranſom, and the moſt part of the Souldiers and the chief of the Companies, having ſuch, and ſo manie paiſoners as they would.

Afterward the *Spaniſh* Souldiers entered by the Breach without anie reſiſtance, for ours eſteemed they would hold their faith and compoſition that they ſhould have their lives ſaved. They entred in with a great furie to kill, pillage, and to rifle all they reteined: ſom hoping to have ranſom, they tied their ſtones with Arquebuſ-cords, which was caſt over a pike which two held upon their ſhoulders, then pulled the ſaid cord with a great violence and deriſion, as if they would ring a bell, telling them that they muſt put themſelvs to the ranſom, and tell of what houſes they were; and if they ſaw they could have no profit, made them cruelly die between their hands, or preſently after their genital parts would have faln into a gangrene, and total mortification; but they kil'd them all with their daggers, and cut their throats. See now their great crueltie and perfidiouſneſs, let him truſt to it that will. Now to return to my purpoſe, beeing lead from the Caſtle to the Citie with Monſieur *de Martigues*, there was a Gentleman of the Duke of *Savoyes*, who asked mee if Monſieur *de Martigues* wound was curable, I anſwered not; who preſently went and told the Duke of *Savoy*; now I thought hee would ſend Phyſicians and Surgeons to viſit and dreſs my Said Monſieur *de Martigues*: in the mean time I thought with my ſelf whether I ought to make it nice, and not to acknowledg my ſelf a Surgeon, for fear leſt they ſhould retein mee to dreſs their wounded, and in the end they would know I was the King's Surgeon, and that they would make mee paie a great ranſom. On the other ſide I feared, if I ſhould not make my ſelf known to bee a Surgeon, and to have carefully dreſſed Monſieur *de Martigues*, they would cut my throat, ſo that I took a reſolution to make it appear to them hee would not die for want of good dreſſing and looking to. Soon after, ſee, there arrive divers Gentlemen accompanied with the Phyſician and Surgeon to the Emperor, and thoſe of the ſaid Duke of *Savoy*, with ſix other Surgeons following the Armie, to ſee the hurt of the ſaid Lord of *Martigues*, and to know of mee how I had dreſſed him, and with what medicines. The Emperor's Phyſician bid mee declare the eſſence of the wound, and how I had dreſt it. Now all the aſſiſtance had a verie attentive ear to know if the wound were mortal or not; I began to make a diſcourſ that Monſieur *de Martigues* looking over the wall to perceiv them that did undermine it, received a ſhot from an Arquebuſ quite through the bodie; preſently I was called to dreſs him, I ſaw hee caſt blood out of his mouth, and his wounds. Moreover hee had a great difficultie of breathing, and caſt out winde by the ſaid wounds with a whiſtling, in ſo much that it would blow out a candle, and hee ſaid, hee had a moſt ſharp pricking pain at the entrance of the bullet. I do believ and think it might bee ſom little pieces of bones which prickt the Lungs. When they made their Syſtole and Diaſtole, I put my finger into him; where I found the entrance of the bullet to have broken the fourth Rib in the middle, and ſcales of bones which the ſaid bullet had thruſt in, and the out-going of it had likewiſe broken the fift Rib with pieces of bones which had been driv'n from within outward; I drew out ſom, but not all, becauſ they were verie deep and adherent I put in each wound a Tent, having the head verie large, tied with a thred, leſt by the inſpiration it might bee drawn into the capacitie of the *Thorax*, which hath been known by experience to the detriment of the poor wounded; for being faln in, it cannot bee taken out, which is the cauſ that engender's putrefaction, a thing contrarie to nature. The ſaid Tents were annointed with a medicine compoſed of yelks of eggs, *Venice*-Turpentine, with a little oil of Roſes: My intention for putting the Tents was to ſtaie the flux of blood, and to hinder that the outward air did not enter into the breſt, which might have cooled the Lungs and by conſequent the heart. The ſaid Tents were alſo put, to the end that iſſue might bee given for the blood that was ſpilt within the *Thorax*. I put upon the wound great Emplaſters of *Diacalcitheos* in which I had relented oil of Roſes and Vineger to the avoiding of inflammation, then I put great ſtupes of *Oxycrate*, and bound him up, but not hard, to the end hee might have eaſie reſpirations; that don, I drew from

him five porrengers of blood from the Baſilick vein of the right arm, to the end, to make revulſion of the blood which run's from the wounds into the *Thorax*, having firſt taken indication from the wounded part, and chiefly his forces, conſidering his youth and his ſanguine temper; Hee preſently after went to ſtool, and by his urine and ſiege caſt great quantitie of blood. And as for the pain which hee ſaid hee felt at the entrance of the bullet, which was as if hee had been pricked with a bodkin, that was becauſ the Lungs by their motion beat againſt the ſplinters of the broken Rib. Now the Lungs are covered with a coat comming from the membrane called *Pleura*, interweaved with nervs of the *ſixt Conjugation* from the brain, which was cauſ of the extreme pain hee felt; likewiſe hee had great difficultie of breathing, which proceeded from the blood which was ſpilt in the capacitie of the *Thorax*, and upon the *Diaphragm*, the principal inſtrument of reſpiration, and from the dilaceration of the muſcles which are between each Rib, which help alſo to make the exſpiration and the inſpiration; and likewiſe becauſ the Lungs were torn and wounded by the bullet, which hath cauſſed him ever ſince to ſpit black and putrid blood in coughing. The fever ſeazed him ſoon after hee was hurt, with faintings and ſwoonings. It ſeemed to mee that the ſaid fever proceeded from the putredinous vapors ariſing from the blood which is out of his proper veſſels, which hath faln down, and will yet flow down. The wound of the Lungs is grown great and will grow more great, becauſ it is in perpetual motion, both ſleeping and waking, and is dilated and compreſt to let the air to the heart, and caſt fuliginous vapors out: by the unnatural heat is made inflammation, then the expulſive virtue is conſtreined to caſt out by cough whatſoever is obnoxious unto it: for the Lungs cannot bee purged but by coughing, and by coughing the wound is dilated, and grow's greater, from whence the blood iſſues out in great abundance, which blood is drawn from the heart by the vein arterial to give them nouriſhment, and to the heart by the *vena cava*; his meat was barlie-broth, ſtued prunes, ſomtimes *panado*; his drink was Ptiſan: Hee could not lie but upon his back which ſhewed hee had a great quantitie of blood ſpilt within the capacitie of the *Thorax*, and beeing ſpread or ſpilled along the ſpondyls, doth not ſo much preſs the Lungs as it doth beeing laid on the ſides or ſitting.

What ſhall I ſaie more, but that the Said Lord *Martigues* ſince the time hee was hurt hath not repoſed one hour onely, and hath alwaies caſt out bloodie urines and ſtools. Theſe things then *Meſſieres* conſidered, one can make no other prognoſtick but that hee will die in a few daies, which is to my great grief. Having ended my diſcourſ, I dreſt him as I was wont; having diſcovered his wounds, the Phyſicians and other aſſiſtants preſently knew the truth of what I had ſaid.

The ſaid Phyſicians having felt his pulſ and known his forces to bee almoſt ſpent and aboliſhed, concluded with mee that in a few daies hee would die; and at the ſame inſtant went all toward the Lord of *Savoy*, where they all ſaid, that the ſaid Lord *Martigues* would die in a ſhort time; hee anſwered, it were poſſible if hee were well dreſt hee might eſcape: Then they all with one voice ſaid, hee had been verie well dreſt, and ſolicited with all things neceſſarie for the curing of his wounds, and could not bee better, and that it was impoſſible to cure him, and that his wound was mortal of neceſſitie. The Monſieur *de Savoy* ſhewed himſelf to bee verie much diſcontented and wept, and asked them again if for certain they all held him deplored and remedileſs, they all anſwered, yes. Then a certain *Spaniſh* impoſtor offered himſelf, who promiſed on his life that hee would cure him, and if hee failed to cure him, they ſhould cut him in an hundred pieces; but hee would not have anie Phyſicians, Surgeons, or Apothecaries with him. And at the ſame inſtant the Said Lord of *Savoy* told the Phyſicians and Surgeons they ſhould not in anie wiſe go anie more to ſee the Said Lord of *Martigues*. Alſo hee ſent a Gentleman to mee to forbid mee upon pain of life not to touch anie more the Said Lord of *Martigues*, which I promiſed not do; wherefore I was verie glad, ſeeing hee ſhould not die in my hands, and commanded the ſaid Impoſtor to dreſs the ſaid Lord of *Martigues*. And that hee ſhould have no other Phyſicians nor Surgeons but him; hee came preſently to the ſaid Lord of *Martigues*, who told him,

Senor Cavallero el ſenor Dugue me ha mandado que venieſſe á curar voſtra herida, yo os juro á Dios que antes de ocho dias yo os haga ſubir á Cavallo con la lanſa en puno contaſque no ago que yo quos togue, Comereis y bibereis todas comidas que fueren de voſtro guſto y yo hare la dieta pro V. m.y deſto os de veu aſeguirar ſobre de mi, yo be ſanado muchos que tenian magores heridas que la voſtra. That is to ſaie, Lord *Cavallcere*, Monſieur the Duke of *Savoy*, hath commanded mee to com dreſs thy wound; I ſwear to thee by God, that before eight daies I will make thee mount on horſ-back with thy Lance in thy hand, provided that no man may touch thee but my ſelf; thou ſhalt eat and drink anie thing thou haſt a minde to, I will perform thy diet for thee, and of this thou maieſt bee aſſured upon my promiſe, I have cured divers who have had greater wounds then thine: and the Lord replied, God give you grace to do it.

Hee demanded of the Said Lord a ſhirt, and tore it in little rags, which hee put a croſs, muttering and murmuring certain words over the wounds; and having dreſt him, permitted him to eat and drink what hee would, telling him hee would obſerv a diet for him, which hee did, eating but ſix prunes and ſix bits of bread at a meal, and drinking but beer. Notwithſtanding, two daies after, the Said Lord of *Martigues* died; and my *Spaniard*, ſeeing of him in the Agonie, eclip'ſt himſelf and got away without bidding farewel to anie bodie; and I beleev if hee had been taken, hee had been hang'd for his falſ promiſes, which hee had made to Monſieur the Duke of *Savoy*, and to divers other gentlemen.

Hee died about ten of the clock in the morning, and after dinner, the Said Lord of *Savoy*, ſent Phyſicians, and Surgeons, and his Apothecarie, with a great quantitie of Drogues, to embalm him; they came accompanied with divers Gentlemen and Captains of the Armie.

The Emperor's Surgeon came neer to mee, and praied mee kindly to open the bodie; which I refuſed, telling him I was not worthie to carrie his plaſter-box after him: hee praied mee again, which then I did for his ſake, if it ſo liked him. I would yet again have excuſed my ſelf, that ſeeing hee was not willing

willing to embalm him,that hee would give this charge to another Surgeon of the companie; hee made mee yet anſwer,that hee would it ſhould bee I,and if I would not do it,I might hereafter repent it:knowing this his affection,for fear hee ſhould not do mee anie diſpleaſure,I took the raſor and preſented it to all in particular, telling them I was not well practiſed to do ſuch operations which they all refuſed.

The bodie beeing placed upon a table,truely I purpoſed to ſhew them that I was an Anotomiſt,declaring to them divers things,which ſhould bee here too long to recite.I began to tell all the companie that I was ſure the bullet had broken too ribs,and that it had paſs'd through the Lungs, and that they ſhould finde the wound much enlarged, becauſ they are in perpetual motion, ſleeping or waking, and by this motion the wound was the more dilacerated. Alſo that there was great quantitie of blood ſpilt in the capacitie of the breſt, and upon the midriff, and ſplinters of the broken ribs which were beaten in at the entrance of the bullet,and the iſſuing forth of it,had carried out. Indeed all which I had told them was found true in the dead bodie.

One of the Phyſicians asked mee,which way the blood might paſs to bee caſt out by urine, beeing conteined in the *Thorax*.I anſwered him that there was a manifeſt conduit,which is the *Vena Azygos*,who having nouriſh'd the ribs,the reſt of the blood deſcend's under the *Diaphragm*,& on the left ſide is conjoined to the emulgent vein, which is the waie by which the matter in *pleureſies* and in *Empiema*,do manifeſtly emptie themſelvs by urine and ſtool. As it is likewiſe ſeen, the pure milk of the breſts of women newly brought to bed,to deſcend by the *Mammillarie*-Veins, and to bee evacuated downwards by the neck of the womb without beeing mixt with the blood.And ſuch a thing is don (as it were by a miracle of nature)by her expulſive and ſequeſting virtue,which is ſeen by experience of two glaſs-veſſels called Mount-wine; let the one bee filled with water,and the other with Claret-wine, and let them bee put the one upon the other, that is to ſaie,that which ſhall bee filled with water, upon that which ſhall bee filled with wine; and you ſhall apparéntly ſee the wine mount up to the top of the veſſel quite through the water, and the water deſcend a traverſ the wine, and go to the bottom of the veſſel without mixture of both; and if ſuch a thing bee don ſo exteriorly and openly to the ſenſ of our eie, by things without life: you muſt believ the ſame in our underſtanding. That nature can make matter and blood to paſs, having been out of their veſſels,yea,through the bones,without beeing mingled with the good blood.

Our diſcourſ ended:I embalmed the bodie,and put it into a coffin; after that the Emperor's Surgeon took mee apart,and told mee if I would remain with him that hee would uſe mee verie well, and that hee would clothe mee anew, alſo that I ſhould ride on horſ-back. I thank'd him verie kindely for the honor hee did mee,and told him that I had no deſire to do ſervice to ſtrangers, and enemies to my countrie; then hee told mee I was a fool,and if hee were priſoner as I,hee would ſerv the devil to get his libertie. In the end I told him flat that I would not dwell at all with him.

The Emperor's Phyſician returned toward the ſaid Lord of *Savoy*,where hee declared the cauſ of the death of the ſaid Lord of *Martigues*,and told him that it was impoſſible for all the men in the world to have cured him; and confirmed again, that I had don what was neceſſarie to bee don, and praied him to win mee to his ſervice, and ſpake better of mee then I deſerved.

Having been perſwaded to take mee to his ſervice,hee gave charge to one of his ſtewards named Monſieur *du Bouchet*, to tell mee,if I would dwel in his ſervice that hee would uſe mee kindely:,I anſwered him that I thank'd him moſt humbly,and that I had reſolved not to dwel with anie ſtranger. This my anſwer beeing heard by the Duke of *Savoy*,hee was ſomwhat in choler,& ſaid,he would ſend mee to the Gallies.

Monſieur *de Vaudeville*,Governor of *Gravelin*,and Colonel of the ſeventeen Enſigns of foot, praied him to give mee to him,to dreſs him of an ulcer which hee had in his leg this ſix or ſeven years; Monſieur *de Savoy* told him becauſ I was of worth, that hee was content,and if I rankled his leg it would bee well don; Hee anſwered that if hee perceived anie thing,hee would cauſ my throat to bee cut.

Soon after,t he ſaid Lord of *Vaudeville* ſent for mee by four Germane Halberdiers,which affrighted mee much, not knowing whither they led mee,they ſpake no more *French* then I high *Dutch*;beeing arrived at his lodging, hee told mee I was welcom, and that I was his; and as ſoon as I ſhould have cured him of that ulcer in his leg, that hee would give mee leav to bee gon without taking anie ranſom of mee. I told him that I was not able to paie anie ranſom.

Then hee made his Phyſician and Surgeons in ordinarie to ſhew mee his ulcerated leg; having ſeen and conſidered it, wee went apart into a chamber where I began to tell them, that the ſaid ulcer was annual,not beeing ſimple but complicated: that is of a round figure and ſcalie, having the lips hard and callous, hollow and ſordid: accompanied with a great varicous vein which did perpetually feed it; beſides a great tumor,and a phlegmonous diſtemper verie painful through the whole leg,in a bodie of cholerick complexion; as the hair of his face and beard demonſtrated. The method to cure it, (if cured it could bee) was to begin with univerſal things, that is,with purgation and bleeding,and with this order of diet,that hee ſhould uot uſe anie wine at all,nor anie ſalt meats,or of great nouriſhment,chiefly theſe which did heat the blood: afterward the cure muſt begin with divers ſcarifications about the ulcer, and totally cutting away the callous edges or lips,and giving a long or a triangular figure,for the round vvill verie hardly cure, as the Antients have left it in vvriting, vvhich is ſeen by experience. That don, the filth muſt bee mundifiſed,as alſo the corrupted fleſh, vvhich ſhould bee don vvith *Unguentum Ægyptiacum*, and upon it a bolſter dipt in juice of Plantain and Nightſhade and *Oxycrate*, and roul the leg beginning at the foot, and finiſhing at the knee, not forgetting a little bolſter upon the *Varicous* vein, to the end no ſuperfluities ſhould flovv to the ulcer. Moreover that hee ſhould take reſt in his bed, vvhich is commanded by *Hippocrates*,vvho ſaith,that thoſe vvho have ſore legs ſhould not uſe much ſtanding or ſitting, but lying along.And after theſe things don and the ulcer vvell mundified, a plate of Lead rubbed vvith

quickſilver

quickſilver ſhould bee applied. See then the means, by which the ſaid Lord *Vaudeville* might bee cured of the ſaid ulcer; all which they found good. Then the Phyſician left mee with the Surgeon, and went to the Lord *Vaudeville*; to tell him that hee did aſſure him I would cure him, and told him that I had reſolved to do for the cure of his ulcer: whereof hee was verie joyful. Hee made mee to bee called to him, and asked mee if I was of the opinion that this ulcer could bee cured, and I told him, yes, provided hee would bee obedient to what hee ought. Hee made mee a promiſe hee would perform all things which I would appoint; and as ſoon as his ulcer ſhould bee cured, hee would give mee libertie to return without paying anie ranſom. Then I beſeech'd him to com to a better compoſition with mee, telling him that the time would bee too long to bee in libertie, if I ſtaied till hee was perfectly well, and that I hoped with in fifteen daies the ulcer ſhould bee diminiſhed more then one half, and it ſhould bee without pain, and that his Phyſicians and Surgeons would finiſh the reſt of the cure verie eaſily. To which hee agree'd, and then I took a piece of paper, and cut it the largeneſs of the ulcer, which I gave him, and kept as much my ſelf. I praied him to keep promiſe, when hee ſhould finde his buſineſs don: Hee ſwore by the faith of a Gentleman hee would doe it; then I reſolved to dreſs him well according to the method of *Galen*, which was, that after all ſtrange things were taken out of the ulcer, and that there wanted nothing but filling up with fleſh, I dreſt him but once a daie, and hee found that verie ſtrange. And likewiſe his Phyſician which was but a freſh man in thoſe affairs, who would perſwade mee with the patient, to dreſs him two or three times a daie, I praied him to let mee do what I thought good; and that it was not to prolong the cure, but on the contrarie to haſten it, for the great deſire I had to bee in libertie. And that hee would look in *Galen* in the fourth book of the compoſition of medicaments *ſecundum genera*, who ſaith, that if a medicine do not remain long upon the part it profit's not ſo much, as when it doth continue long; a thing which manie Phyſicians have been ignorant of, and have thought it hath been better to change the Plaſter often And this ill cuſtom is ſo inveterate and rooted, that the Patients themſelvs accuſe often-times the Surgeons of negligence, becauſ they do not oftner remove their emplaſters; But they are deceived. For as you have read in my works in divers places: The qualities of all bodies which mutually touch, operate one againſt another, and both of them ſuffer ſomthing, where one of them is much ſtronger then the other, by means whereof the ſaid qualities are united, they familiariſe with the time, although they are much differing from the manner, that the qualitie of the medicament doth unite, and ſomtimes becom's like to that of the bodie, which is a verie profitable thing. Therefore they ſaie hee is to bee praiſed much who firſt invented not to change the plaſter ſo often, becauſ it is known by experience, this is a good invention.

Moreover it is ſaid, great fault is committed to dreſs ulcers often in wiping of them hard, for one take's not away onely the unprofitable excrement, which is the *pus* or *Sanies* of the ulcer, but the matter whereof the fleſh is engendred; wherefore for the reaſons aforeſaid it is not needful to dreſs ulcers ſo often.

The ſaid Lord *Vaudeville*, would ſee whether that which I alleged out of *Galen* were true, and commanded the ſaid Phyſician to look there, for that hee would knovv it; hee cauſed the book to bee brought upon the table, vvhere my ſaying vvas found true, and then the Phyſician vvas aſhamed, and I verie joyful. So that the ſaid Lord of *Vaudeville* deſired not to bee dreſſed but once a daie, inſomuch that within fifteen daies the ulcer was almoſt cicatrized; the compoſition beeing made between us, I began to be merrie. Hee made mee eat & drink at his Table, when there were not men of more great rank with him.

Hee gave mee a great red ſcarf, which hee commanded mee to wear. I may ſaie I was as glad of it as a dog that hath a clog, for fear hee ſhould go into the vineyard and eat the grapes. The Phyſician and Surgeon led mee through the Camp to viſit their hurt people, where I took notice what our enemies did; I perceived they had no more pieces of Cannon, but onely thentie five or thirtie pieces for the field.

Monſieur *de Vaudeville* held Monſieur *de Bauge* priſoner, the brother of Monſieur *de Martigues* who died at *Hedin*. The ſaid Lord of *Bauge* was priſoner in the Caſtle of the heap of wood belonging to the Emperor, who had been taken at *Therouenne* by two *Spaniſh* Souldiers. Now the ſaid Lord of *Vaudeville* having looked well upon him, conceived hee muſt bee a Gentleman of ſom good houſ, and to bee the better aſſured, hee cauſſed him to have his ſtockings pulled off, and ſeeing his ſtockings and his feet clear and neat, together with his white fine ſock, it confirmed him the better in his opinion, that it was a man was able to paie ſom good ranſom. Hee demand's of the Souldiers if they would take thirtie Crowns for their priſoner, and that hee would give it to them preſently, to which they agree'd willingly, becauſ they had neither means to keep him, nor feed him; beſides they knew not his worth, thereſore they delivered their priſoner into the hands of the ſaid Lord of *Vaudeville*, who preſently ſent him to the Caſtle of the heap of wood with a guard of four Souldiers with other Gentlemen priſoners of ours. The ſaid Lord *Bauge* would not diſcover himſelf, who hee was, and endured verie much, beeing kept but with bread and water, and laie upon a little ſtraw. The ſaid Lord of *Vaudeville* after the taking of *Hedin*, ſent word to the ſaid Lord *Bauge* and other priſoners, that the place of *Hedin* was taken, and the liſt of thoſe that had been ſlain, and amongſt the reſt, Monſieur *de Martigues*: and when the ſaid Lord of *Bauge* heard the ſound of the death of his brother the Lord *Martigues*, hee began much to weep and lament; his keeper demanded of him, vvhy hee made ſo manie and ſo great lamentations? Hee declared unto them that it vvas for Monſieur *de Martigues* his brother's ſake. Having underſtood that, the Captain of the Caſtle diſpatch'd a man avvaie quickly, to tell it to Monſieur *de Vaudeville* that hee had a good priſoner; vvho having received this good nevvs rejoiced greatly, and the next daie ſent mee vvith his Phyſician and four Souldiers to the Wood-caſtle to knovv if his priſoner vvould give him fifteen thouſand Crovvns for a ranſom; hee vvould ſend him free to his ovvn houſ, and for the preſent hee deſired but the ſecuri-

tie

tie of two Merchants of *Antwerp*, that hee would name. The ſaid Lord *Vaudeville* perſwaded mee that I would make his agreement with his priſoner. See then why hee ſent mee to the wooden Caſtle, and commanded the Captain of the Caſtle to uſe him well, and to put him into a Chamber hung with Tapeſtrie, and that they ſhould make the guard more ſtrong, and from that time they made him good chear at his expence.

The anſwer of the Said Lord of *Bauge* was, that to put himſelf to ranſom hee was not able; and that, that depended upon Monſieur *d'Eſtamps* his Uncle, and of Miſtris *de Breſſure* his Aunt, and than hee had not anie means to paie ſuch a ranſom. I returned with my keepers to the ſaid Lord *Vaudeville*, and told him the anſwer of his ſaid priſoner, who told mee, Perhaps hee ſhould not out at ſo good a rate, which was true, for hee was diſcovered. And forthwith the Queen of *Hungarie*, and the Duke of *Savoy* ſent word to the Lord *Vaudeville*, that this morſel was too great for him, and that hee muſt ſend him to them, (which hee did) and that hee had enough priſoners beſides him: hee was put to fourtie thouſand Crowns ranſom beſides other expenſes.

Returning toward the Said Lord *Vaudeville* I paſſed by S. *Omer*, where I ſaw their great pieces of batterie, whereof the greateſt part was flawed and broken. I came back alſo by *Thereüenne*, where I did not ſee ſo much as ſtone upon ſtone, unleſs the mark of a great Church. For the Emperor gave commandment to the countrie people within five or ſix leagues about, that they ſhould emptie and carrie awaie the ſtones; inſomuch, that now one may drive a cart over the Cittie, as is likewiſe don at *Hedin*, without anie appearance of Caſtle or Fortreſs. See then the miſchief which com's by the wars.

And to return to my purpoſe, preſently after my ſaid Lord *Vaudeville* was verie well of his ulcer and little wanted of the entire cure, which was the cauſ hee gave mee my leav, and made mee bee conducted with a Paſs-port by a Trumpet to *Abbeville*, where I took poſt, and went and found the King *Henrie* my Maſter at *Auſimon*, who received mee with joie, and a good countenance.

Hee ſent for the Duke of *Guiſe* the high Conſtable of *France*, and Monſieur *d'Eſtrez*, to underſtand by mee what had paſt at the taking of *Hedin*; and I made him a faithful report, and aſſured them I had ſeen the great pieces of Batterie, which they had carried to S. *Omer*. Whereof the King was verie joyful, becauſ hee feared leſt the enemie ſhould com further into *France*. Hee gave mee two hundred Crowns to retire my ſelf to my own houſ, and I was verie glad to bee in libertie and out of this great torment and noiſ of thunder from the Diabolick artillerie, and far from the Souldiers, blaſphemers and deniers of God. I will not omit to tell here that, after the taking of *Hedin*, the King was advertiſed that I was not ſlain, but that I was a priſoner, which his Majeſtie cauſſed to bee written to my wife by Monſieur *du Goguier* his chief Phyſician, and that ſhee ſhould not bee in anie trouble of minde for mee, for that I was ſafe and well, and that hee would paie my ranſom.

The battel of S. Quintin, 1557.

AFter the battel of S. *Quintin*, the King ſent for mee to the Fere in *Tartenois* toward Monſieur the Marſhal of *Bourdillon*, to have a paſs-port by the Duke of *Savoie* to go to dreſs Monſieur the Conſtable, who was grievouſly hurt with a Piſtol-ſhot in the back, whereof hee was like to die, and remained a priſoner in his enemie's hands. But the Duke of *Savoy* would not give conſent that I ſhould go to the Said Lord Conſtable, ſaying, hee ſhould not remain without a Surgeon, and that hee doubted I was not ſent onely to dreſs him, but to give him ſom advertiſement, and that hee knew I underſtood ſomthing elſ beſides Surgerie, and that hee knew mee to have been his priſoner at *Hedin*. Monſieur the Marſhal of *Bourdillon* advertiſed the King of the Duke's denial, by which means the King writ to the ſaid Lord of *Bourdillon*, that if my Ladie, the Lord high Conſtable's wife, did ſend anie bodie of her houſ, which was an able man, that I ſhould give him a letter, and that I ſhould alſo have told him by word of mouth, what the King and monſieur the Cardinal of *Lorraine* had given mee in charge. Two daies after there arrive's a ſervant of the Lord Conſtables chamber, who brought him ſhirts, and other linnen, for which the ſaid Lord Marſhal gave paſs-port, to go to the Said Lord Conſtable; I was verie glad thereof, and gave him my letter, and gave him his leſſon, of that which his Maſter ſhould do, beeing priſoner. I had thought beeing diſcharged of my embaſſage to return toward the King. But the ſaid Lord of *Bourdillon* prai'd mee to ſtaie with him at the Fere to dreſs a great number of people who were hurt, and were thither retired after the battel; and that hee vvould ſend vvord to the King, the cauſ of my ſtaie; vvhich I did. The vvounds of the hurt people vvere greatly ſtinking, and full of vvorms vvith Gangrene and putrefaction; ſo that I vvas conſtreined to com to my knife to amputate that vvhich vvas ſpoil'd, which was not without cutting off arms and legs, as alſo to Trepan divers. Now there were not anie medicines to bee had at the Fere, becauſ the Surgeons of our Camp had carried all with them; I found out that the Chariot of the Artillerie tarried behinde at the Fere, nor had it yet been touched I prai'd the Lord Marſhal that hee would cauſ ſom of the drogues to bee delivered to mee which were in it; which hee did, and there was given to mee one half at a time: five or ſix daies after I was conſtreined to take the reſt, neither was there half enough to dreſs ſo great a number of the people, and to correct and ſtaie the putrifaction, and to kill the worms that were entred into their wounds; I waſhed them with *Ægyptiacum* diſſolved in wine and *Aqua vitæ*, and did for them, all which I could poſſible, yet notwithſtanding all my diligence, verie manie of them died.

There were Gentlemen at the Fere who had charge to finde out the dead bodie of Monſieur *de Boiſe-Dolphin* the elder, who had been ſlain in the battel; they praied mee to accompanie them to the Camp to finde him out amongſt the dead, if it were poſſible, which indeed was impoſſible; ſeeing that the bodies were all diſfavoured and overwhelmed with putrefaction. Wee ſaw more then half a league about us the earth covered with dead bodies, neither could wee abide long there, for the cadaverous ſents, which did ariſe from the dead bodies, as well of men as of horſes. And I think wee were the cauſ, that ſo great a num-

a number of flies,roſe from the dead bodies, which were procreated by their humiditie and the heat of the Sun, having their tails green and blew; that beeing up in the air made a ſhadow in the Sun. Wee heard them buz,or hum,which was much marvel to us. And I think it was enough to cauſ the Plague, where they alighted. (My little maſter) I would you had been there as I was,to diſtinguiſh the ordures and alſo to make report to them which were never there.Now beeing cloied and annoied in that Countrie,I prai'd Monſieur the Lord Marſhal, to give mee my leav to bee gon, and that I was affraid I ſhould bee ſick, by reaſon of my too great pains,and the ſtinks which did ariſe from the wounded bodies,which did almoſt all die, for what diligence ſoever was uſed unto them. Hee made other Surgeons to com finiſh the dreſſing of the ſaid hurt people, and I went away with his good grace and favor. Hee wrote a letter to the King, of the pains hee had taken with the poor wounded. Then I returned to *Paris*, where I found yet manie Gentlemen who had been hurt, and were there retired after the battel.

The voiage of the camp of Amiens.1558

THe King ſent mee to *Dourlan*, and made mee bee conducted by Captain *Govaſt* with fiftie men in arms,for fear I ſhould bee taken by the enemies. And ſeeing that in the waie wee were alwaies in alarms, I cauſſed my man to alight, making him to bee my maſter for that time,and I got upon his horſ,which carried my mail, and took his cloak and hat, and gave him my ambling Mare. My man beeing put upon her back, one would have taken him for the maſter, and I for the ſervant.Thoſe of *Dourlan* ſeeing us far off, thought wee were enemies, and let flie their Cannon-ſhot at us.Captain *Gavaſt* my conductor,made ſign with his hat, that wee were not enemies, ſo that they left ſhooting,and wee entred into *Dourlan* with great joie. Thoſe of *Dourlan* made a ſallie forth,upon the enemies five or ſix daies before,who kil'd and hurt divers of our Captains, and good ſouldiers; and amongſt the reſt Captain St.*Aubin* valiant at the ſword,whom Monſieur *de Guiſe* loved verie well,and for whom chiefly the King ſent mee thither, who beeing in the fit of a quartan fever, would needs go out to command the greateſt part of his companie: a *Spaniard* ſeeing him that hee commanded, perceived hee was a Captain, and ſhot a musket-bullet quite through his neck; my Captain St. *Aubin* thought with this ſtroak hee was dead, and with the fear (I proteſt to God) hee loſt his quartan ague, and was altogether free'd from it. I dreſſed him with *Antonie Portal* Surgeon in ordinarie to the King, and divers other Souldiers: ſom died, others eſcaped quite with the loſs of a leg,or an arm,or the loſs of an eie,and they ſaid they eſcaped good cheap, eſcape that can.When the enemie had broke their Camp, I returned to *Paris*.Here I hold my peace of my little maſter, who was more at eaſ in his houſ, then I at the Wars.

The voiage of *Harbor* of Grace.1563.

YEt I will not omit to ſpeak of the voiage of the *Harbor* of Grace; then when they made the approches to plant the Artillerie, the Engliſh who were within it kil'd ſom of our Souldiers,and divers Pioners,who undermined, who when they were ſeen to bee ſo hurt that there was no hope of curing, their fellows ſtript them and put them yet alive,in the Mines,which ſerved them for ſo much filling earth.The *Engliſh* ſeeing they could not withſtand an aſſault, becauſ they were verie much attainted with diſeaſes,and chiefly with the plague, they yielded, their lives and jewels ſaved. The King cauſſed them to have ſhips to return to *England*, beeing glad to bee out of this place infected with the Plague: the greateſt part died, and carrid the plague into *England*,and ſince have not yet been exempted. Captain *Sarlabous* maſter of the Camp, was left there in garriſon, with ſix Enſigns on foot, who had no fear of the plague, and were verie joiful to enter therein, hoping there to make good cheer. My little maſter had you been there you had don as they.

The voiage to Rouen.1562.

NOw for the taking of *Roüen* they kil'd divers of otrs before the aſſault,and at the aſſault: the daie after they entred into the Cittie,I trepaned eight or nine, who were hurt at the breach with the ſtroaks of ſtones. There was ſo malignant an air, that divers died, yea of verie ſmall hurts, inſomuch that ſom thought they had poiſoned their bullets: thoſe within ſaid the like by us,for although they were vvell treated in their neceſſities vvithin the cittie, yet they died alſo as vvell as thoſe vvithout. The King of *Navar* vvas hurt in the ſhoulder vvith a bullet ſom few daies before the aſſault; I viſited and helpt to dreſs him, vvith his ovvn Surgeon, named M. *Gilbert* one of the chief of *Montpelier*, and others.They could not finde the bullet,I ſearch'd for it verie exactly, I perceived by conjecture,that it vvas entred by the head of the *Adjutorium*, and that it had run into the cavitie of the ſaid bone, vvhich vvas the cauſ vvee could not finde it. The moſt part of them ſaid it vvas entred and loſt vvithin the cavitie of the bodie.Monſieur the Prince of the *Rock upon Yon*, vvho intimately loved the King of *Navar*, drevv mee to one ſide,and askt mee if the vvound vvas mortal. I told him yea, becauſ all vvounds made in great joints, and principally contuſed vvounds, vvere mortal according to all Autors vvho had vvritten of them. Hee inquired of the others vvhat they thought, and chiefly of the ſaid *Gilbert*, vvho told him that hee had great hope that the king his maſter vvould bee cured, and the Said Prince vvas verie joyful. Four daies after the King and the Queen-mother, Monſieur the Cardinal of *Bourbon* his brother, Monſieur the Prince of *Rock upon Yon*, Monſieur *de Guiſe*, and other great perſonages,after vvee had dreſſed the King of *Navar*, cauſſeda conſultation to bee made in their preſences,vvhere there vvere divers Phyſicians and Surgeons: each man ſaid vvhat ſeemed good unto him, and there vvas not one of them,vvho had not good hope of him,ſaying that the King vvould bee cured,& I perſiſted alvvaies on the contrarie.

Monſieur the Prince of the *Rock upon Yon* vvho loved mee, vvithdrevv mee aſide, and ſaid I vvas onely againſt the opinion of all the reſt, and praied mee not to bee obſtinate againſt ſo manie vvorthie men. I anſvvered him, that vvhen I ſavv anie good ſigns of cure, I vvould change my adviſe. Divers conſultations vvere made,vvhere I never changed my vvord, and prognoſtick, ſuch as I had made at the firſt dreſſing,and alvvaies ſaid that the arm vvould fall into a Gangrene,vvhich it did,what diligence ſoever could bee had for the contrarie; and gave up his ſoul to God the eighteenth daie of his hurt. Monſieur the Prince *upon Yon*, having heard of the death of the Said King, ſent his Phyſician and Surgeon toward mee,

mee, named *Feure* now in ordinarie to the King, and to the Queen-mother, to tell mee, that hee would have the bullet taken out, and that it ſhould bee look't for in what place ſoever it could bee found: then I was verie joyful, and told them that I was well aſſured to finde it quickly, which I did in their preſences, and divers Gentlemen. It was lodged in the verie midſt of the cavitie of the Adiutorie bone. My Said Prince having it, ſhewed it to the King and the Queen, who all ſaid my prognoſtick was found true. The bodie was laid to reſt in the Caſtl.-Galliard, and I returned to *Paris* where I found divers hurt men who were hurt at the breach of *Roüen*, and chiefly *Italians*, who deſired mee verie much to dreſs them, which I did willingly; there were divers that recovered, and others died. I believ (my little maſter) you were called to dreſs ſom of them, for the great number there was of them.

The voiage of the battel of *Dreux*, 1592.

THe daie after the battel given at *Dreux*, the King commanded mee, to go dreſs Monſieur the Count of *Eu*, who had been hurt with a Piſtol-ſhot in the right thigh, neer the joint of the hip; which fractured and broke the *Os femoris* in divers places, from whence divers accidents did ariſe, and then death, which was to my great grief. The daie after my arrival I would go to the field, where the battel was given, to ſee the dead bodies; I ſaw a league about, all the earth covered, where there was by eſtimation five and twentie thouſand men and more. All which were diſpatch'd in the ſpace of two hours. I would (my little maſter) for the love I bear you, that you had been there to recount it to your ſcholars and to your children. Now in the mean time while I was at *Dreux* I viſited and dreſt a great number of gentlemen and poor ſouldiers, and amongſt the reſt manie *Swiſſer*-Captains, I dreſſed fourteen in one chamber onely all hurt with Piſtol-ſhot, and other inſtruments of diabolical fire, and not one of the fourteen died. Monſieur the Count of *Eu* beeing dead, I made no long tarrying at *Dreux*: there came Surgeons from *Paris* who performed well their dutie toward the hurt people, as *Pigray*, *Cointeret*, *Hubert*, and others; and I returned to *Paris*, where I found divers gentlemen wounded, who had retired themſelvs thither after the battel to bee dreſt of their hurts.

The voiage of the battel of *Moncontour*, 1569.

DVring the battel of *Moncontour* King *Charls* was at *Pleſsis* the Towers, where hee heard they had won it; a great number of hurt gentlemen and Souldiers withdrew themſelvs into the Cittie and ſuburbs of Towers, to bee dreſt and help'd, where the King and Queen-Mother commanded mee to ſhew my dutie with the other Surgeons, who were then in quarter, as *Pigray*, *du Bois*, *Portail*, and one named *Siret*, a Surgeon of *Towers*, a man verie skilful in Surgerie, and at that time Surgeon to the Kings brother, and for the multitude of the wounded wee were but little in repoſe, nor the Phyſicians likewiſe. Count *Mansfield* Governor of the *Duchie* of *Luxembourg*, Knight of the King of *Spains* order, was greatly hurt in the battel, in the left arm, with a Piſtol-ſhot, which broke a great part of the joint of the elbow, and had retired himſelf to *Bourgueil* neer *Towers*; beeing there hee ſent a gentleman to the King, affectionately to beſeech him to ſend one of his Surgeons to help him in his hurt. Councel was held what Surgeon ſhould bee ſent. Monſieur the Marſhal of *Montmorency* told the King and Queen, that it were beſt to ſend him his chief Surgeon, and declared to them that the Said Lord *Mansfield* was one part of the cauſ of winning the battel. The King ſaid flat hee would not that I ſhould go, but would have mee remain cloſe to him. Then the Queen-Mother ſaid, I ſhould but go and com, and that hee muſt conſider it was a ſtrange Lord, who was com from the king of *Spain*'s ſide, to help and ſuccour him. And upon this hee permitted mee to go, provided that I ſhould return quickly. After this reſolution hee ſent for mee, and likewiſe the Queen-Mother, and commanded mee to go finde the Said Lord *Mansfield* in the place, where I was to ſerv him in all I could, for the cure of his hurt; I went and found him, having with mee a letter from their Majeſties: having ſeen it, hee received mee with a good will, and from thenceforth diſcharged three other Surgeons that dreſt him; which was to my great grief, becauſ his hurt ſeemed to mee uncurable. Now at *Bourgueil* there were retired divers Gentlemen, who had been hurt at the ſaid battel, knowing that Monſieur *de Guiſe* was there, who had been alſo verie much hurt with a Piſtol-ſhot through one leg, well aſſured that hee would have good Surgeons to dreſs him, and alſo that hee, beeing kinde and liberal, would aſsiſt them with a great part of their neceſsities. And for my part, I did help and aid them with all my Art, as much as it was poſsible; ſom died, ſom recovered according to their hurts. The Count *Ringrave* died, who had ſuch a ſhot in the ſhoulder, as the king of *Navar* before *Roüen*. Monſieur *de Baſſompiere* Colonel of twelv hundred horſ, was hurt alſo in ſuch a like place as Count *Mansfield*, whom I dreſt and God cured. God ſo well bleſſed my vvork that vvithin three vveeks I led him back to *Paris*, vvhere I muſt as yet make ſom inciſions in the arm of the Said Lord *Mansfield*, to dravv out the bones vvhich vvere greatly broken and caries'd: hee vvas cured by the grace of God, and gave mee an honeſt revvard, ſo that I vvas vvell contented vvith him, and hee vvith mee, as hee hath ſince made it appear: hee vvrit a letter to the Duke of *Aſcot* hovv that hee vvas cured of his hurt, and alſo Monſieur *de Baſſompiere* of his, and divers others, vvhich I had dreſt after the battel of *Montcontour*, and counſelled him to beſeech the king of *France* my good maſter to give mee leav to go ſee Monſieur the Marqueſs of *Auret* his brother.

Voiage of *Flanders*.

MOnſieur the Duke of *Aſcot* did not fail to ſend a Gentleman to the king vvith a letter, humbly to beſeech him to do him ſo much good and honour, as to permit and command his chief Surgeon to com to ſee the Marqueſs of *Auret* his brother; vvho had received a Musket-ſhot near the knee, vvith fracture of the bone, about ſeven months ſince, vvhich the Phyſicians and Surgeons in thoſe parts vvere much troubled to cure. The King ſent for mee and comman ded mee to go ſee the Said Lord *Auret*, and to help him in all that I could for the cure of his hurt; I told him I vvould emploie all all that little knovvledge vvhich it hath pleaſed God to give mee. I vvent then conducted by tvvo gentlemen to the Caſtle of *Auret*, vvhich is a league and a half from *Mounts* in *Hainaut*, vvhere the Said Marqueſs vvas: as ſoon as I arrived I viſited him, and told him the King had commanded mee to com to ſee him,

and

and to dreſs him of his hurt; hee told mee hee was glad of my comming, and was much bound to the King to haved on him the honor to have ſent mee to him I found him in a great fever his eies verie much ſunk, with a countenance gaſtlie and yellow, his tongue drie and rough, and all the bodie emaciated and lean, his ſpeech low like that of a dying man: then I found his thigh much ſwelled, apoſtemated, ulcerated, and caſting out a green ſtinking matter; I ſearch'd it with a ſilver probe, and by the ſame I found a cavitie neer the groin, ending in the middle of the thigh, and others about the knee, ſanious and cuniculous; alſo certain ſcales of bones, ſom ſeparated, others not. The legs were much tumified, and ſoaked with a pituitous humor, cold, moiſt, and flatulent; inſomuch that the natural heat was in the waie to bee ſuffocated, and exſtinguiſhed, and the ſaid leg crooked and retracted toward the buttocks, his rump ulcerated the bredth of the palm of an hand, and hee ſaid hee felt there a great pain and ſmarting, and likewiſe in his reins, inſomuch that hee could not take anie reſt night or daie; neither had hee anie appetite to eat, but to drink enough; it was told mee that hee fell often into faintings and ſwoonings, and ſomtimes as it were by an Epilepſie, and had oftentimes deſire to vomit, with ſuch a trembling that hee could not carrie his hands to his mouth. Seeing and conſidering all theſe great accidents, and the forces much abated; truly I was much grieved to have gon to him, becauſ mee thought there was little appearance that hee could eſcape. Notwithſtanding to give him courage and good hope, I told him, that I would quickly ſet him on foot by the grace of God, and the Phyſician's and Surgeon's help. Having ſeen him, I went a walking into a Garden, where I praied to God that hee would give mee the grace to cure him, and that hee would give a bleſſing to our hands and medicaments, to combate againſt ſo manie complicated maladies. I bethought in my minde the waies I muſt keep to do it. They called mee to dinner, I entred into the kitchin where I ſaw taken out of a great pot, half a Mutton, a quarter of Veal, three great pieces of Beef, and two pullets, and a great piece of Bacon, with great ſtore of good Herbs. Then I ſaid to my ſelf this broth was full of juice, and of good nouriſhment; After dinner all the Phyſicians and Surgeons aſſembled, wee entred into conference in the preſence of Monſieur the Duke of *Aſcot*, and ſom Gentlemen that did accompanie him; I began to tell the Surgeons that I marvelled much they had made no apertions in the Marqueſs's thigh, which was all apoſtumated, and the matter that iſſued out was foul and ſtinking, which ſhewed it had a long time lurked there, and that I had found with my probe a *Caries* in the bone, and ſmall ſcales which were alreadie ſeparated; they made mee anſwer, hee would never give conſent and likewiſe it mas almoſt two months ſince they could win him to put on clean ſheets on his bed, neither durſt anie one ſcarce touch the coverlet hee felt ſo great pain. Then ſaid I, for to cure him, wee muſt touch other things then the coverlet of the bed. Each one ſaid what hee thought beſt of the Lord's grief, and for concluſion held it altogether deplorable. I told them there was yet ſom hope, becauſ of his youth, and that God and nature do ſomtime ſuch things which ſeem to Phyſicians and Surgeons to bee impoſsible. My conſultation was, that all thoſe accidents were com by reaſon of the bullet hitting near the joint of the knee, which had broken the ligaments, tendons, and *aponeuroſes* of the muſcles which tie the ſaid joint together with the *Os femoris*; alſo nervs, veins, and arteries from whence had followed pain, inflammation, apoſteme and ulcer: and that wee muſt begin the cure by the diſeaſ, which was the cauſ of all the ſaid accidents, that is to ſaie, to make apertions, to give iſſue to the matter reteined in the interſpaces of the muſcles, and in the ſubſtance of them: Likewiſe to the bones which cauſſed a great corruption in the whole thigh, from whence the vapors did ariſe and were carried to the heart, which cauſſed the ſyncope and the fever; and the fever an univerſal heat through the whole bodie; and by conſequent, depravation of the whol *Oeconomie*; Likewiſe that the ſaid vapors were communicated to the brain, which cauſſed the Epilepſie, and trembling, and to the ſtomach diſdain and loathing, and hindred it from doing his functions, which are chiefly to concoct and digeſt the meat, and to convert it into *Chylus*; which not beeing well concocted, they ingender crudities and obſtructions, which make's that the parts are not nouriſhed, and by conſequent the bodie drie's, and grow's lean; and becauſ alſo it did not do anie exerciſe, for everie part which hath not his motion remaineth languid, and *atrophiated*, becauſ the heat and ſpirits are not ſent or drawn thither, from whence follow's mortification. And to nouriſh and fatten the bodie, frictions muſt bee made univerſally through the whole bodie, with warm linnen clothes above, below, on the right ſide: and left, and round about: to the end to draw the blood and ſpirits from within outward, and to reſolv anie fuliginous vapors reteined between the skin, and the fleſh; thereby the parts ſhall bee nouriſhed and reſtored, (as I have heretofore ſaid in the tenth book treating of the wounds of Gun-ſhot) and wee muſt then ceaſ when wee ſee heat and redneſs in the skin, for fear of reſolving that wee have alreadie drawn, and by conſequent make it becom more lean. As for the ulcer which hee hath upon his rump, which came through too long lying upon it without beeing removed, which was the cauſ that the ſpirits could not flouriſh or ſhine in it; by the means of which there ſhould bee inflammation, apoſteme and then ulcer, yea with loſs of ſubſtance of the ſubject fleſh, with a verie great pain: becauſ of the nervs which are diſſeminated in this part. That wee muſt likewiſe put him into another ſoft bed, and give him a clean ſhirt, and ſheets; otherwiſe all that wee could do would ſerv for nothing, becauſ that thoſe excrements and vapors of the matter reteined ſo long in his bed, are drawn in by the Syſtole and Diaſtole of the Arteries which are diſſeminated through the skin, and cauſ the ſpirits to change and acquire an ill qualitie and corruption which is ſeen in ſom that ſhall lie in a bed where one hath ſweat for the Pox, who will get the Pox by the putrid vapors which ſhall remain ſoaked in the ſheets and coverlets. Now the cauſ why hee could in no wiſe ſleep, and was as it were in a conſumption, 'twas becauſ hee ate little, and did not do anie exerciſe, and becauſ hee was grieved with extreme pain. For there is nothing that abateth ſo much the ſtrength as pain. The cauſ why his tongue was drie and ſowl, was through the vehemencie of the heat of the fever, by the vapors which aſcended

through

through the whole bodie to the mouth. For as wee ſaie in a common proverb, when the oven is well heat, the throat feel's it. Having diſcourſed of the cauſſes and accidents, I ſaid they muſt bee cured by their contraries, and firſt wee muſt appeaſ the pain, making apertions in the thigh to evacuate the matter reteined, not evacuating all at a time for fear leſt by a ſudden great evacuation there might happen a great decaie of ſpirits which might much weaken the patient and ſhorten his daies. Secondly, to look unto the great ſwelling and cold of his leg, fearing leſt it ſhould fall into a Gangrene; and that actual heat muſt bee applied unto him, becauſ the potential could not reduce the intemperature *de potentia ad actum*; for this cauſ hot bricks muſt bee applied round about, on which ſhould bee caſt a decoction of nerval herbs boiled in wine and vineger, then wrapt up in ſom napkin, and to the feet an earthen bottle filled with the ſaid decoction, ſtopt and wrapt up with ſom linnen clothes; alſo that fomentations muſt bee made upon the thigh, and the whole Leg, of a decoction made of Sage, Roſemarie, Tyme, Lavender, flowers of Camomile, Melilot, and red-Roſes boiled in white-Wine, and a *Lixivium* made with Okeaſhes, with a little Vineger, and half an handful of ſalt. This decoction hath virtue to attenuate, inciſe, reſolv and drie the groſs viſcous humor. The ſaid fomentations muſt bee uſed a long while, to the end there may bee a greater reſolution; for beeing ſo don a long time together, more is reſolved then attracted, becauſ the humor conteined in the part is liquified, the skin and the fleſh of the muſcles is rarified. Thirdly, that there muſt bee applied upon the rump a great emplaſter made of the red deſiccative and *unguentum Comitiſſæ* of each equal parts incorporated together, to the end to appeaſ his pain and drie up the ulcer, alſo to make him a little doun-pillow which might bear his rump aloft without leaning upon it. Fourthly, to refreſh the heat of his kidnies one ſhould applie the unguent called *Refrigerans Galeni* freſhly made, and upon that the leavs of water-Lilies. Then a napkin dipt in *Oxycrate*, wrung out and often renewed: and for the corroboration and ſtrengthening of his heart a refreſhing medicine ſhould bee applied made with oil of *nenuphar*, and unguent of Roſes and a little ſaffron diſſolved in Roſe-vineger, and Triacle ſpread upon a piece of Scarlet: For the *Syncope* which proceeded from the debilitation of the natural ſtrength troubling the brain. Alſo hee muſt uſe good nouriſhment full of juice, as rere eggs, Damask-prunes ſtewed in wine and ſugar, alſo *Panado* made of the broth of the great pot (of which I have alreadie ſpoken) with the white fleſhie parts of Capons, and Partridg-wings minced ſmall, and other roſt-meat eaſie of digeſtion, as Veal, Goat, Pigeon, Partridg, and the like. The ſauce ſhould bee Orenges, Verjuice, Sorrel, ſharp Pomgranats; and that hee ſhould likewiſe eat of them boiled with good herbs; as Sorrel, Lettuce, Purſlain, Succorie, Bugloſs, Marigolds, and other the like. At night hee might uſe cleanſed Barlie with juice of *Nenuphar* and Sorrel, of each two ounces, with five or ſix grains of *Opium* and of the four cold ſeeds bruiſed, of each half an ounce, which is a remedie nouriſhing and medicinal, which will provoke him to ſleep: that his bread ſhould bee of Meſlin, neither too new, nor too ſtale; and for the great pain of his head, his hair muſt bee cut, and rub his head with *Oxirrhodinum* luke-warm, and leav a double-cloth wet therein upon it; likewiſe ſhould bee made for him a frontal of oil of Roſes, *Nenuphar*, Poppies, and a little *opium* and Roſe-Vineger, and a little Camphir and to renew it ſomtimes. Moreover one ſhould cauſ him to ſmel to the flowers of Henbane and *Nenuphar* bruiſed with Vineger, Roſe-water and a little Camphir wrapped in a handkercher, which ſhall bee often and a long time held to his noſe, to the end that the ſmell may bee communicated to the brain, and theſe things to bee continued, till that the great inflammation and pain bee paſt, for fear of cooling the brain too much. Beſides one may cauſ it to rain artificially in powring down from ſom high place into a kettle, and that it may make ſuch a noiſ that the patient may hear it, by theſe means ſleep ſhall bee provoked on him. And as for the retraction of his leg that there was hope to redreſs it, when evacuation was made of the matter and other humors conteined in the thigh, which by their extention (made by repletion) have drawn back the leg, which might bee remedied in rubbing the whole joint of the knee with *unguentum Dialthæa* and oil of Lilies, and a little *aqua vitæ*, and upon it to bee laid, black-wool with the greaſ thereof. Likewiſe putting in the ham of a feather-pillow folded in double, and by little and little to make his leg to ſtretch out. All which my diſcourſ was well approoved of by the Phyſicians and Surgeons. the conſultation ended wee went to the ſick patient, and I made him three apertions in his thigh, from whence iſſued out great quantitie of matter and *Sanies*; and at the ſame time I drew out ſom ſcales of bones, nor would I let out too much abundance of the ſaid matter for fear of too much decaying his ſtrength: Then two or three hours after I cauſſed a bed to bee made near his own, where there were clean white ſheets, then a ſtrong man lifted him into it, and rejoiced much in that hee was taken out of his foul ſtinking bed. Soon after hee demanded to ſleep, which hee did almoſt four hours, where all the people of the houſ began to rejoice, chiefly Monſieur the Duke of *Aſcot* his brother.

The daies following I made injections into the bottom of the cavities of the ulcer, made with *Egyptiacum*, diſſolved ſomtimes in *aqua vitæ*, and ſomtimes in wine. I applied to mundifie and drie the ſpongie and looſ fleſh, bolſters; at the bottom of the ſinuoſities, hollow tents of lead, that the *Sanies* might have paſſage out; and upon it a great Emplaſter of *Diacalcitheos* diſſolved in wine: likewiſe I did rowl it with ſuch dexteritie, that hee had no pain, which beeing appeaſed the fever began much to diminiſh. Then I made him drink wine moderately allaied with water, knowing that it reſtore's and quicken's the ſpirits: and all the things which wee reſted on in the conſultation were accompliſht, according to time and order; and his pains and fever ceaſed, hee began to grow better and diſcharged two of his Surgeons, and one of his Phyſicians, ſo that wee were but three with him. Now I remained thereabout two months, which was not without ſeeing divers ſick people, as well rich as poor, which came to mee three or four leagues about. They gave meat and drink to the needie, all which hee recommended to mee, and praied

mee alſo for his ſake to help them. I proteſt I did not refuſe anie one, and did to them what I poſſibly could, whereof hee was joyful. Then when I ſaw hee began to mend, I told him hee muſt have a conſort of Violons and a Jeſter to make him merrie, which hee did: in one month wee ſo wrought, that hee could hold himſelf up in a chair, and made himſelf to bee carried and walk in his garden, and at the gate of his Caſtle to ſee the people paſs by. The Countrie people of two or three leagues about, knowing they could ſee him, came the feaſt daie male and female, to ſing and dance pell mell, in joie of his amendment, all beeing verie glad to ſee him, which was not don without good laughing and drinking. Hee caus'd ſtill a barrel of beer to bee given them, and they drank all merrily to his good health. And the Citizens of *Mont Hainaut* and other gentlemen neighbors came to ſee him in admiration, as a man comming from the tomb. And as ſoon as hee began to mend, hee was not without companie, and as one went out another came in to viſit him: his table was alwaies well covered. Hee was greatly loved of the Nobilitie, and of the common people, as well for his liberalitie as by reaſon of his beautie, and honeſtie, having a pleaſant look and a gracious ſpeech, inſomuch that thoſe that beheld his face were conſtrained to love him. The chief of the Cittie of *Monts* came on Saturdaie to beſeech him to permit mee to go to *Mons* where they had a great deſire to feaſt and make mee good chear for his ſake. Hee told them hee would praie mee to go there, which hee did. But I made them anſwer that they ſhould not do mee ſo much honor, as alſo that they could not give mee better chear then I had with him. And hee praied mee again affectionately to go thither, and that I ſhould do that for his ſake, to which I agree'd. The daie after they fetcht mee with two Coaches, and beeing arrived at *Monts* wee found the dinner readie, and the chief of the Cittie with their wives, ſtaied for mee with a good will. Wee went to the Table and they placed mee at the upper end, and drank all to mee, and to the health of Monſieur *D'auret*, ſaying that hee was verie happie, and they likewiſe to have obteined mee to take him in hand, for that they knew that in this companie, hee was greatly honored and loved. After dinner they led mee back to the Caſtle of *Auret*, where Monſieur the Marqueſs ſtaied for mee with great exſpectation to recount unto him, what wee had don in our banquet, I told him that all the companie had drank divers times to his health; in ſix weeks hee began to uphold himſelf a little with crutches, and to grow verie fat and get a livelie natural colour. Now hee had a deſire to go to *Beaumont* which is the dwelling place of Monſieur the Duke of *Aſcot*, and made himſelf bee carried in a great chair with eight men by turns, and the Countrie folks where wee paſſed along, knowing 'twas Monſieur the Marqueſs fought and ſtrove together who ſhould carrie him, and conſtrained us to drink, but it was but Beer, but I believ had it been Wine or Hippocras they would have given it us with a verie good will, ſo much did they ſhew themſelvs joyful to ſee the Said Marqueſs, and praied all to God for him. Beeing arrived at *Beaumont* all the people came before us to do him reverence, and praied God to bleſs him, and keep him in good health. Wee entred into the Caſtle where there was more then fiftie gentlemen which the Duke of *Aſcot* had ſent for to com make good chear with his brother, who kept his table furniſht three daies together. After dinner the gentlemen ran at the Ring, plaied at Foils, and rejoiced greatly to ſee Monſieur *Auret*, becauſ they had heard hee would never com out of his bed again, or bee cured of his hurt. I was alwaies at the upper end of the table, where everie one drank carouſes to him, and mee, thinking to make mee foxt, which they could not do: For I drank but according to my old cuſtom. A few daies after wee returned back and took leav of Madam the Dutcheſs of *Aſcot*, who took a Diamond-ring from her finger which ſhee gave mee, acknowledging I had verie well dreſt her brother; which Diamond was better worth then fiftie Crowns. Monſieur *Auret* grew ſtill better and better, and walked all alone round about his garden with crutches. I beg'd leav of him divers times to com awaie to *Paris*, declaring that his Phyſician and Surgeon would well do the reſt that remained, for the cure of his grief. And now to begin a little to eſtrange my ſelf from him, I praied him to give mee leav to go ſee the Cittie of *Antwerp*, which hee willingly accorded to: and commanded his Steward to conduct mee thither accompanied with two pages: wee paſſed through *Malignes* and *Bruxelle*, where the chief of the Cittie praied the Said Steward, that at our return they might hear of it; and that they had a great deſire to feaſt mee, as they of *Monts* had don. I thank'd them moſt kindely, and told them that I was not worthie of ſuch honor; I was two daies and a half to ſee the Cittie of *Antwerp*, where ſom Merchants knowing the Steward, praied him to do them the honor, that they might beſtow a dinner or ſupper upon us. There was ſtriving who ſhould have us, and were all verie joiful to hear of the good health of the Marqueſs of *Auret*, doing mee more honor then I exſpected. To conclude, wee came back to the Marqueſs making good cheer, and within five or ſix daies I asked my leav of him, which hee granted with great grief, and gave mee an honeſt Preſent, and of great value, and made mee bee conducted by the ſaid maiſter of his houſ and tvvo Pages, even to my houſ at *Paris*.

I have forgot to tell you, that the *Spaniards* have ſince ruined, and demoliſht his Caſtle of *Auret*, ſack't, pillag'd, rifled and burnt all the houſes, and Villages belonging unto him, becauſ hee vvould not bee of their ſide, in the ſlaughters and ruines of the Lovv Countries.

The voiage of *Bourges*, 1562

THe King vvith his Camp remained not long at *Bourges*, but thoſe vvithin yielded it up, and vvent out vvith their jevvels ſaved. I knovv nothing vvorthie of memorie, but that a boie of the Kings privie kitchin, vvho beeing neer the vvalls of the Cittie before the compoſition vvas made, cried vvith a loud voice, Hugue not, huguenot, ſhoot here, ſhoot here having his arms lifted up, and his hand ſtretched out; a ſouldier ſhot his hand quite through vvith a bullet: having received his ſtroak, hee came and found mee out to dreſs him. My Lord high-Conſtable, ſeeing the boie to have his hand all bloodie, and all rent and torn; demanded of him vvho had hurt him. Then there vvas a Gentleman vvho ſavv the ſhot made, ſaid it vvas vvell beſtovved becauſ hee cried, *Huguenot*, ſhoot here, ſhoot here.

here. Then the Said Lord Conſtable ſaid this *Huguenot* was a good musketeer, and pare a pittiful minde, for it was verie likelie if hee would have ſhot at his head, hee might have don it more eaſily then in the hand. I dreſs'd the ſaid Cook who was verie ſick, but at length was cured, but with lameneſs of his hand, and ever ſince his companions call him *Huguenot*; hee is living.

The battel of S. Denis, 1567

AND as for the battel of Saint *Denis* there were divers ſlain as well on one ſide, as on the other: ours beeing hurt, went back to *Paris* to bee dreſſed together with the priſoners who were taken, whereof I dreſſed a great part. The King commanded mee, by the requeſt of the Ladie high-Conſtable, to go to her houſ to dreſs my Lord, who had received a Piſtol-ſhot in the middle of the ſpondils of his back, whereby hee preſently loſt all ſenſ and motion of thighs and legs, with retention of excrements, not beeing able to caſt out his Urine, nor anie thing by the fundament, becauſ that the ſpinal marrow, (from whence proceed the ſinews to give ſenſ and motion to the inferiour parts,) was bruiſed, broken, and torn by the vehemence of the bullet. Hee likewiſe loſt his reaſon, and underſtanding, and in a few daies hee died. The Surgeons of *Paris* were a long time troubled to dreſs the ſaid wounded people, I believ (my little maſter) that you ſaw ſom of them. I beſeech the great God of victories, that wee may never bee emploied in ſuch evil encounters and diſaſters.

The voiage of Bayonne, 1564.

NOW I ſaie moreover, what I did in the voiage with the King to *Bayonne*, where wee have been two years and more to compaſs all this Kingdom, where in divers Citties and Villages I have been called into conſultations for divers diſeaſes, with the deceaſed Monſieur *Chaplain* chief Phyſician to the King and Monſieur *Chaſtellan* chief to the Queen-Mother, a man of great honor and knowledge in Phyſick and Surgerie: making this voiage I was alwaies inquiſitive of the Surgeons if they had marked anie rare thing of remark in their practice, to the end to learn ſom new thing. Beeing at *Bayonne* there happened two things of remark for the young Surgeons. The firſt was, that I dreſt a Spaniſh Gentleman, who had a grievous great impoſtume in his throat: hee came to have been touched by the deceaſed King *Charls* for the Evil. I made inciſion in his Apoſteme, where there was found great quantitie of creeping worms as big as the point of a ſpindle, having a black head; and there was great quantitie of rotten fleſh. Moreover there was under his tongue an impoſtume called *Ranula*, which hindred him to utter forth his words, and to eat and ſwallow his meat: hee praied mee with his held up hands to open it for him if it could bee don without peril of his perſon, which I immediately did, and found under my Lancet a ſolid bodie, which was five ſtones, like thoſe which are drawn from the bladder. The greateſt was as big as an Almond and the other like little long Beans, which were five in number; in this apoſteme was conteined a ſlimie humor of a yellow color which was more then four ſpoonfuls; I left him in the hands of a Surgeon of the Cittie to finiſh his cure.

Monſieur *de Funtain* Knight of the Kings Order, had a great continual peſtilent Fever, accompanied with divers Carboncles in divers parts of his bodie, who was two daies without ceaſing to bleed at at noſe, nor could it bee ſtanch'd; and by that means the fever ceaſed with a verie great ſweat, and ſoon after the Carboncles ripened and were by mee dreſſed, and, by the grace of God, cured.

I have publiſh'd this Apologie to the end that each man may know, with what foot I have alwaies marched, and I think there is not anie man ſo tickliſh, which taketh not in good part what I have ſaid, ſeeing my diſcourſ is true, and that the effect ſheweth the thing to the eie, reaſon beeing my warrant againſt all Calumnies.

The end of the Apologie and Voiages.

FINIS.

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FINIS.

ΑΓΓΕΙΟΛΟΓΙΑ:

Or, A

Description of the Vessells in the body of

MAN,

Of the three kinds, *i. e.*

OF THE

VEINS, ARTERIES, and NERVES,

Especially of those in the Limbs and Habit of the Body:

Whereof there are also given Anatomicall Figures,
(the largest and faireſt that ever were publiſhed with any ENGLISH Book.)

In three Tractates.

Translated out of the Anatomie of *Adrianus Spigelius*, by whom these parts are more largely and accurately described then by other Authors; the more ful tractation whereof, being a part of Anatomie so usefull in order to Chirurgicall Operations, hath been judged very worthy to be annexed unto this present work.

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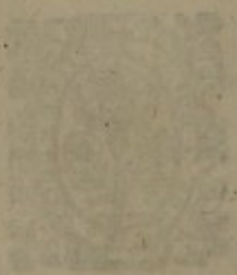


The Preface.

OF how great consequence a more perfect knowledge of Anatomie is to the Art of Physick, and Chirurgery, hath been frequently and abundantly made out by Anatomists, Physitians and Chirurgeons, upon occasion, in their severall writings; though the thing it self speak so plainly in its own behalf, that much need not be said in this kind. The case is plain, that with the like facility and successe may a Mariner, making out some unknown land, steer his course through the main Ocean, where nothing but sea and skie appears, without the help of his Card and Compasse; as a Physician judg of the naturall action, or preternaturall affect of any part of the body; or a Chirurgeon institute any operation about the same, without the Anatomicall knowledge thereof; and therefore no more shall be said to this effect. Anatomie may be very commodiously reduced to four distinct kinds, or distinguished according to so many principall parts. 1. Σπλαγχνολογία, Splanchnologie; that is, the description of the Bowels contained in the three Cavities or Bellies of the body; the lower, middle, and supreme. Οστεολογία, Osteologie, which is the description of all the bones of the body. 3. Μυολογία, Myologie, being the Anatomicall history of all the Muscles. 4. Αγγειολογία, Angeiologie, describing all the Vessells of the body: i. e. the Veins, Arteries, and Nerves; these last, though having no sensible cavities, being reputed vessells in the account of Anatomists. Now though all these parts or kinds of Anatomie, are needfull both to Physick and Chirurgery; yet are they not all of a like necessity to both: but the first of more absolute neceſſity to the Art of Physick; the other three, to Chirurgery. And therefore though all four have been treated on by the learned author of this Volume; yet in reason it could not but be advantagious and acceptable to Chirurgeons to have some farther helps in our English tongue, for improvement in the three later kinds before mentioned, or in some of them at least. Now for Osteologie, the parts themselves, or the dry bones are and may be kept at hand, for frequent view and contemplation upon them; whereby their severall Figures, Articulations, and all other particulars observable about them, may be rendred familiar; in order to practice about Fractures and Luxations: and without such Autopsie, much cannot

be acquired by the reading of Deſcriptions, or ſight of Delineations. Toward a Myologie, there hath been a peculiar tractate of late publiſhed in Engliſh, which may be uſeful in that reſpect to thoſe who cannot peruſe Latin Authors. So that the greateſt want ſeemed to be in that kind or part of Anatomie, which is the laſt in the Enumeration, i. e. *Angeiologie, or the Deſcription of the Veſſells; the more exact or particular knowledge whereof, eſpecially of thoſe in the Habit of the body, will appear, upon a true accompt, more neceſſary to the exerciſe of Chirurgicall operations, at greater certainty, and with more ſecurity, then the knowledg of the Muſcles. Upon theſe conſiderations, being conſulted by the Publiſher of this Work, what peece or Tractate in any kind, of Chirurgery or Anatomy, I thought might to good purpoſe be added thereunto; I reſolved him, that I could think of nothing more advantagious in this kind, then a fuller and more accurate Anatomicall Deſcription of the Veins, Arteries, and Nerves in the body of Man, tranſlated out of the Anatomie of* Spigelius; *adding alſo the moſt uſefull Anatomicall Figures, relating to the ſaid Deſcriptions, of the ſame largeneſſe as they are in the Editions of the ſaid Author in* folio; *which were firſt taken out of* Veſalius, *and are the largeſt and faireſt that are extant: the caſe being here, as in Mathematical inſtruments, in which, how much the largeneſſe conduceth to certainty in uſe, is well known. Accordingly he hath not ſpared for care and coſt, in procuring a Scholar every way competent to tranſlate the Deſcriptions of theſe parts, out of the forementioned author; and an able Artificer to cut the Figures. And as the werk is now accompliſhed, I doubt not but good improvement may be made thereof, by ſuch Chirurgeons, as being not able to make uſe of the Originall, ſtand in need of ſuch helps, if they will not be wanting to themſelves for induſtry in the uſe hereof.*

J. G.

THE

The first Treatise,
Concerning
The VEINES.

CHAP. I.

Reckons up the branches or propagations of the vena portæ *or the Gate-vein, and explains an Aphorism of* Hippocrates, *that makes very much to the purpose.*

Note that the Letters, which are enclosed thus [ ] refer to the particular tables at the end of that Treatise, wherein they are set.

LEt us come now to the History of the veins, in which we will begin with the *vena portæ* or gate-vein, as that which spreads not so wide and far as the common hollow one. For it is wont to be distributed only through the lowest belly, and not at all to propagate it self out of it; nor does it branch through all the parts of that, but such only as are appropriated to the nutritive faculty, namely the Liver, the bladder of Gall, the Stomach, the Spleen, the Sweet-bread, Kall, Guts, and Mesentery, for the Hollow vein sends its propagations to the rest, as the Reins, Bladder, and those parts which serve for generation. But that the manner of this distribution may be more easily understood, for our better method in teaching, likening the whole vein to a tree, we will divide it into four parts, one of which we will call the Roots, as that part which is in the Liver; another the Trunk, which continues it self on and is not divided; a third the Branches into which the Trunk is divided; a fourth, Twigs or Surcles, such small veins as the Trunk shoots out at its sides; before it be divided into its branches. Which terms ought diligently to be observed, because we have endeavoured by the propriety of these words to give light to this obscure Treatise concerning the veins. But that they may more easily be committed to memory, and all that concerns this business be written with more brevity, following some very learned later Authors, we will give every part its name from the place of its insertion.

Through what parts the Gate-vein is dispersed.

The division of the Gate-vein into the roots, trunk, branches and twigs.

From the outside then of the Liver some very little hairy veins are prolonged towards its inner region, and by little and little meet together into greater branches, so that at length they become five, which again gathered together like roots about the middle of the hollow side of the Liver, but somewhat hinderly near to the back, make a notable stock or Trunk, which at length issuing forth near to those eminencies of the liver, which by the Greeks are termed πύλαι Gates, is cal'd the Gate-vein, and now deserves the name of a Trunk.

The Roots.

The Trunk.

This Trunk parting now from the Liver descends somewhat obliquely towards the left side, under the Gut cal'd *Duodenum*, where above the Rack-bones it gets a firm seat; but before it be divided into branches, two twigs sprout from it; the first of which being very small, arising out of the uppermost and forepart of the Trunk, as soon as it is come forth from the Liver, is scattered into the neck, and body of the bladder of Gall, or into its outer coat, with a numerous succession of very little branches, such as we have said above are called hairy veins. This twig is cald in Greek κυστικὸς, in Latin you may render it *vesicalis*, the vein of the bladder of Gall. *Vesalius* sayes there are two branches, which run through the bladder of Gall, whence they are called by some *Cysticæ gemellæ*, the twin veins of the Gall, but this makes no great matter. The second twig being greater then the former, but lower, arising from the same fore part, and more to the right, is inserted into *pylorus* or the lower mouth of stomach, into whose hinder part, which looks towards the back, it scatters many small branches, from whence it is commonly called *Gastricus*, the stomach-branch, but perhaps for memories sake it may be better termed *Pyloricus*, or branch of the

The twigs, that grow out before the division of the trunk *Cysticus*.

Gastricus.

the lower mouth of the Stomach, becauſe there are others alſo, which are called Stomach-branches.

The two branches.

Theſe two twigs being thus propagated, the Trunk runs downwards, and inclining all the way ſomewhat to the left is divided into two notable branches, a right, and a left one: the left is ſome thing higher then the right, but leſſer; the right lower, but greater: the left ſpreads it ſelf through the ſtomach, the kell, one part of the *colon* or colique gut, and the ſpleen; the right through the Guts and Meſentery that is called *Splenica* or Spleen-vein, or the linear one; this the Meſenterick.

Splenica.

Circles riſing from the upper part of the Spleenick-branch.

Now the Spleen-vein, after it is thus come forth from the Trunk, is carried athwart, being underpropt by the membrane of the Kall, toward the Spleen, into which before it be conſumed, it ſhoots forth certain twigs, both from its upper part, and from its lower; from its upper part one, that aſcending obliquely to the left ſide of the Stomach, that looks toward the back, is divided into three propagations, of which the outermoſt on either ſide are conveyed into the Stomach, and preſently ſcatter into more twigs; but the middle one aſcending through the ſame hinder part ſpreads itſelf through the upper region of the Stomach, and compaſſes the left orifice or mouth, round about like a crown,

Coronaria.

from whence it is called στεφανῖτα or *Coronaria*, the Crown-vein of the Stomach. This again ſends forth continually ſome ſmall branches upwards to the end of the Gullet, and others downwards through the Stomach. All this branch is called *Gaſtricus*, the Stomach branch, becauſe it is the greateſt, and moſt capacious of all thoſe, which come to the Stomach.

Circles riſing from the lower part of the Spleenick-branch.

Epiploïs Dextra.

From the lower part of the Spleen branch ariſe two twigs; one, which is ſmall, ſending forth other little ſprigs to the right ſide of the lower membrane of the Kell, and the colique Gut annexed thereunto, is commonly called *Epiploïs dextra*, you may Latin it *Omentalis*, the right Kall-vein. Another anſwering to that branch, which ariſes from the higher part of the Spleen-vein, and begets the Crown-vein, is inſerted in the lower membrane of the Kall, and preſently after its riſe is divided into two branches, which parting one from another a great diſtance beget many other twigs, which are ſpent upon the lower membrane of the Kall, which like a Meſentery ties the colique gut to the back, as alſo upon that part of the colique Gut, which is ſo tyed. It is called *Epiploïs*, or *Omentalis poſtica*, the hinder Kall vein. After the Spleen-branch has thus ſcattered many twigs, now drawing near to the Spleen it is cleft into

Epiploïs poſtica.

The diviſion of the Spleenick-branch.

two branches, an upper, and a lower one; which are broken into others in the very *Parenchyma* or fleſh of the Spleen. From the upper, ſometimes before it enters the Spleen, ſometimes when it is already entered, there ſprouts forth a double or threefold twig, very famous among the writers of Phyſick, which they commonly call *vas breve* the ſhort veſſell, but we the venall, to diſtinguiſh it from the Arteriall veſſel that anſwers to it: this is inſerted into the left ſide of the bottom of the Stomach, ſometimes alſo higher, and about the left orifice or mouth.

A propagation of the upper branch.

Which is the cauſe why ſome Phyſitians, and commonly Anatomiſts too have fooliſhly thought, that the melancholick humor is returned from the Spleen through this veſſell back into the Stomach, to provoke appetite. But you may often find bodies, in which it is altogether wanting. From the lower branch, which goes to the nether part of the Spleen, one propagation ariſes, which being pretty big, and notable is reflected towards the right hand, like the foregoing, and compaſſes the bottom of the Stomach on the left ſide, and alſo ſends many little branches to the higher membrane of the Kall on the left ſide; it is called *Gaſtro-epiploïs ſiniſtra*, the left Stomach and Kell-vein.

A propagation of the lower branch.

Gaſtro-epiploïs ſiniſtra.

There is alſo another notable branch, which is found in moſt to ariſe from the lower Spleen-branch; very ſeldom from the Spleen it ſelf. This is carried downwards, and ſcattering twigs over all the left ſide of the colique Gut, goes on further by the whole length of the ſtrait Gut, and at length determins in the membranous ſubſtance thereof, and in the fundament with many little twigs. Phyſitians make mention

Hæmorrhoidalis interna.

of this very often, and call it *Hæmorrhoidalis interna*, the inner emroid vein, to diſtinguiſh it from the outer, which is derived from the Hollow-vein. It is truly and properly called the Emroid vein; I ſay, properly, and truly, becauſe ſometimes they call by that name the veins of the noſtrills, gums, and mouth, that caſt forth blood, and without pain. In this large ſenſe the Philoſopher took it 3. *de part. animal.* where he makes menſtruous purgation alſo a ſpecies of the emroids. But the Emroids properly ſo called by Phyſitians are dilatations of this vein in the fundament, cauſed as well by black and yellow choler, as

1. alſo by a ſalt phlegm, as by the melancholick humor. And theſe are of two kinds; *Cæcæ*, blind piles, which caſt out no blood, but ſwell out like the ſtone of a grape into the fun-

2. dament or out of it: Others *apertæ*, open, which caſt out the blood, which they contain. The learned *Hippocrates* hath left us a peculiar book, a golden one indeed, concerning the cure of theſe. The remaining part of the Spleen-branch is ſpent upon the whole Spleen, and therein is ſcattered into divers and very ſmall propagations, entring the very fleſh of it about the hollow, and middle line. And theſe are the ſprigs which grow out of the Spleen-branch.

The Meſenterick vein, or right branch of the Gate-vein is joined to the Meſentery, as ſoon as it comes from the back, and is divided into two chief branches, which paſſing through

through the Meſentery betwixt its two coats,are each of them cleſt into an infinite number of ſmall branches, and they again into leſs twigs, which going to the guts make up thoſe veins ſo famous among Phyſitians, that are called the Meſaraick-veins. The firſt of theſe branches is called the right Meſenterick vein from the right ſide, wherein it is placed, and is likewiſe twofold, whence it came to paſs, that *Veſalius*, and almoſt all others, who follow him,reckon three Meſenterick veins. This branch is inſerted into the *Jejunum* or empty gut, the *Ileum*, or circled gut, the *cæcum* or blind gut, and the right ſide of the Colique gut,where it lies next to the reins, and liver; and although both its branches ſhoot forth many propagations from themſelves,ſo that it is very hard to expreſſe any number of them,as well becauſe they vary much by reaſon of their ſubjects, as alſo becauſe they do not obſerve the very ſame order and courſe, yet it hath been obſerved,that for the moſt part there are fourteen,which afterwards are ſcattered into an infinite company of other twigs.Theſe when they are come to the guts, only gape with their little mouths into their coat,and enter not the cavity it ſelf,that being compaſſed about within with a certain cruſt. But as we have ſaid above,that in moſt parts of our body,the divarications or diviſions of the veſſels are attended with certain glandules, partly that they may make the ſafer progreſſe,partly leaſt they ſhould ſink down, and withall the flow and ebb of the blood ſo very neceſſary be hindered; ſo here alſo the diviſions of the veſſels, which are ſcattered through the Meſentery, are bolſtered up with certain glandules, which with their propagations obſerve ſuch an exact proportion, that the greater glandules do ſuſtain the greater branches, and the leſs the leſſer. When theſe glandules ſwell with a *Scirrhus* the veſſels being preſt cloſe together, and the diſtribution of the chylus through the veins, and conſequently of the bloud through the body being hindered; there follows a Conſumption, and pining of the whole body. The left Meſenterick vein is divided into the middle part of the Meſentery, and alſo that part of the Colique Gut, which runs from the left region of the Stomach as far as to the ſtrait gut. The *hæmorrhoidalis interna*, or inner Emroid vein, of which we ſpake a little before, ſometimes ariſes from this vein, as *Veſalius* hath obſerved, which affording ſome ſprigs to the Colique gut, at laſt running forward through the whole length of the ſtrait gut, determins in the fundament. But before the Meſenterick trunk be divided into theſe two branches, it firſt ſends forth two propagations, one of which is called *Gaſtro-epiploïs dextra*,or the Right Stomach and Kall-vein, which creeps through the right bottom of the Stomach, before, and behind, as alſo through the upper membrane of the Kall: the other called by others *Inteſtinalis*, or the Gut vein, by us the *Duodena*, reaches to the middle of the Gut *Duodenum*; and the beginning of the Empty gut or *Jejunum*, and deſcends all along through them.

The right Meſenterick branch.

The left Meſenterick.

Propagations that ariſe before the diviſion of the Meſenterick.

Gaſtro-epiploïs Dextra.

Inteſtinalis.

The chief uſe of the Gate-vein is to nouriſh thoſe parts, which are ſeated in the loweſt belly, and need a thicker and more fæculent bloud, ſuch as are all thoſe parts, which ſerve for nutrition. For their blood ought to be thicker, that it might be hotter, when heat is alwayes more powerfull in a thicker body: ſo then the Roots of the Gate-vein nouriſh the Liver,the Trunk nouriſhes the *Pancreas* or Sweet-bread; of the Twigs,the *Cyſticus*, or Gall-twig nouriſhes the bladder of the Gall; the Spleen-branch,all the entrails; which ſerve for nutrition, except the Meſentery,and the Guts; the Twig *Pyloricus*, or of the lower mouth of the Stomach, the *Gaſtricus* or Stomach-branch,both the Stomach and Kall-veins, and the ſhort veſſell nouriſh the Stomach. For I do not think that the ſhort veſſell was made by nature for the carrying back of melancholick humor to the Stomach, but chiefly for its nouriſhments ſake; when that blood, which is generated in the Spleen, is not melancholy, and excrementitious humor, but rather the beſt, although ſomewhat thicker then other bloud, and that becauſe the parts that are to be nouriſhed by the Spleen-branch, needed a thicker bloud, then they which are to be nouriſhed by the Meſenterick. Both the Stomach and Kall-veins nouriſh the upper membrane of the Kall; the right and the hinder *Epiploïs*, or the Kall-veins, the lower. The Spleen is nouriſhed by thoſe two branches, into which the Spleen-vein is cleft, and which enter its *parenchyma*, or fleſh through its middle line: the Meſentery, and almoſt all the Guts by the two Meſenterick branches; the Gut *Duodenum* by the propagations called *Duodena*; but the empty Gut, the *Ileum* or circled Gut the blind Gut, or the right ſide of the Collique or *Colon* by the right Meſenterick-branch. The left ſide of the Colique, and all the ſtrait-Gut by the hæmorrhoidall vein; but the middle part which lies under the Stomach, by the hinder Kall-vein. The ſecond uſe is to attract the *Chylus*, and carry it to the Liver; whoſe veins are moſt famous for the making of bloud. But the ſame veins which nouriſh the Meſenterick branch, do alſo attract the *chylus*, as we ſhall ſhew you hereafter, when we ſhall inſiſt upon the Hiſtory of it. The third uſe is to empty out the excrements from the body through the Guts. Thus we ſee that the cholerick humor is ſometimes poured forth out of the Liver through the Meſenterick-branch in the bloudy flux, and cholerick looſneſs, and the melancholick dregs through the Emroid-vein. The fourth uſe is to help the concoction of the Liver. Thus we ſee that the thicker part of the *chylus*, which is called melancholy,is attracted by the ſpleenick branch, not that the ſeat of melancholy

The firſt uſe of the Gate-vein.

The ſecond uſe.

The third uſe.

The fourth.

is in the Spleen, but that it may be more attenuated, and better concocted by the benefit of the arteries, which are most abounding in the Spleen, and so not disturb, or hinder the concoction, which is famed to be in the veins of the Liver, as it usually happens, that whensoever the Spleen is troubled with any disease, the work of making bloud is presently harmed.

The explanation of a certain Aphorism of *Hippocrates*.

But because there has been mention made here of the Emroid-veins, it seemed, that it would not be unseasonable if I did refer to this place the explanation of a most excellent Aphorism, which is the twelfth of the sixth Section, when it cannot be understood without the History of Anatomy, and is not so faithfully explained by others, as was necessary. *Hippocrates* writes in it, αἱμοῤῥοΐδας ἰηθέντι χρονίας ἢν μὴ μία φυλαχθῇ κίνδυνος ὕδρωπα ἐπιγενέσθαι ἢ φθίσιν, that is, he that is cured of old Emroids, unless one of them be preserved, is in danger of falling into a Dropsie, or Consumption. In explanation hereof we will first doubt of the Aphorism, then we will despute of the manner whereby a Dropsie, or Consumption follows upon the cure of old Emroids. But we may not without cause doubt of the truth of it, because the same *Hippocrates* in a Book concerning the Emroids, which I think to be very much his own, whatever *Mercurialis* say though otherwise a most learned man, bids us to turn the Emroids, and forbids us to leave any unburnt, but to burn them all. And truly *Aetius* in his 14. Book, desirous to reconcile these two places, at those words ἢν μὴ μία φυλαχθῇ, that is, unless one be preserved, being overcome, thinks that a manner of diet is to be understood, not an Emroid, as if *Hippocrates* should say: Thou shalt not cure one that hath long had the Emroids, unless the Patient will diligently observe a convenient manner of diet prescribed by thee; for otherwise there is danger of his falling into a Dropsie, or Consumption. But *Galen* in his Comment upon that Aphorism writes expresly, that *Hippocrates* sayes, that unless one Emroid be preserved, such danger will ensue, and makes no mention at all of diet. And, what is more, dayly experience sufficiently witnesses, that such mischiefs do ensue though never so exact a diet be kept, and the reason taken from the manner, wherein they happen, and which we shall presently explain, does abundantly manifest it. Whence it is evident, that these two places of *Hippocrates* are left still in controversie, and contradicting one another from this answer of *Aetius*. But the right answer will be, if we say, that *Hippocrates* when he writes in his Book of the Emroids, that for a perfect cure they must all be burnt, speaks not of old Emroids, but of such only as are lately come, or when nature has already endeavoured to expell the humor, which was otherwise purged out of the Emroids some other way, whether it be by issues, or by a Fistula, or some ulcer in the Leg. For such may be very well and without danger of Consumption, or Dropsie, the rather, if the entrails be yet whole and sound, and especially if a good rule of diet follow. Nor does the cure of all old Emroids necessarily bring on a Dropsie or Consumption, but only for the most part they threaten a danger of these diseases to ensue, for sometimes the melancholick matter being hurried up into the brains, there follows madness, as it happened to *Alcippus*, in *Hippocrates* 4. *Epidem.* For, sayes he, this *Alcippus* having the Emroids was forbidden to be cured, for after the cure he fell madd, but an accute Feaver following it, he was recovered. For explanation of the second doubt, first let us hear *Galen* for he in his Commentary upon the Aphorism, sayes " That the Emroids come by reason of fæculent and melancholick bloud, which the Liver drives down to the mouths of certain veins, and so this way being stopt, and abundance of gross humor burdens the Liver, and stifles the naturall heat, which being extinguisht, no more bloud is generated, but only water, which nature afterwards driving it into the *abdomen*, or paunch, makes a Dopsie. But if the Liver send that abundance of melancholick humor to the Lungs, some vessell being broken, there follows a Consumption. This interpretation of *Galen*, besides that it seems very obscure to us, is not altogether agreeable to truth. For first, it is false in my judgment, which *Galen* sets down in his Comment, that it is impossible, that the Emroids should be caused without an abundance of fæculent and thick bloud; when it may be proved both by reasons, and authority, that they come also from choler and phlegm. By
1. the authority of *Hippocrates*, who in the beginning of his Book concerning the Emroids, witnesses that this disease is caused in this manner; to wit, when choler, or phlegm falling down into the veins of the Straight-Gut, heats the bloud, which is in the veins. For these veins being heated attract the bloud out of the little veins, that are near, and when they are filled, the inward part of the Seat swels, and the heads of the veins appear out of it.
2. But by reason it is proved thus; when madnesses are caused by phlegm, or choler, as *Hippocrates* witnesses in his Book *De Morbo Sacro*, the same Author in the 6. Aphorism, 21. professes that that madness is taken away, if there follow swellings of the veins, or Emroids in those that are so mad. Now the madness would not be taken away, if melancholick humor did only come forth by the Emroids; for then the cause of the disease would not be purged out. But I my self also have seen formerly in *Germany* some Noblemen, that were troubled with salt catarrhs, afterwards recovered by a great flux of the Emroids; that I am of opinion, that not only melancholy, but also salt phlegm and choler are wont to purged out by the Emroids. Wherefore if it happen, that one, who has been long troubled

bled with the Emroids, be cured afterwards, that choler and phlegm, either breed, obstructions in the Liver, or Spleen, or being gathered together in some plenty by stretching the vessels contained in the *abdomen*, or paunch, breaks through them, or by their quality corrodes and eats their way out, and makes a Dropsie in the *Abdomen*; or else by raising obstructions in the Liver, and extinguishing the naturall heat, generates much water, and serous humor in stead of bloud, which passing through the veins, make a *species* of the Dropsie called *Leucophlegmatia*; but if this humor go back to the Breast, or Lungs, it breaks through, or eats out their vessels, and hence follows a spitting first of bloud, then of corrupt matter, and from thence at last a Consumption, as *Hippocrates* teaches in his Aphorism. But in this place it is first of all to be observed, that there are two sorts of propagations of veins, which make the Emroids: for there are some propagations of the Gate-vein, of which we have already treated; but there are others of the hollow-vein, which arise from the Iliacall branches, of which we are to speak hereafter. Now if the forementioned humors, whether melancholick, or cholerick, or phlegmatick, and salt, flow through the propagations of the Gate-vein, the internall Emroids are caused, which being cured, the matter flows back into the branches of the Gate-vein, that are scattered through the lower Belly into which the veins being loaden with these humors unburden themselves, and make a *species* of the Dropsie called *Ascites*. But if they flow through the branches of the Hollow-vein, they cause the external Emroids, and these being cured against the Precept of *Hippocrates*, there is danger of a Consumption to ensue, because from hence there is an easie passage of the peccant matter through the Hollow-vein to the Lungs, nigh to the Heart. And this is that which we have of a good while observed, that many, who have been long troubled with Fistula's of the Fundament; and afterwards cured, through the ignorance of Physitians, have faln into a spitting of bloud, and then into a Consumption. Nay we remember, that a maid was once cured by us in *Germany*, which had a Fistula in the middle of her Hip, and for three years had sought help from many in vain, but being cured shee fell at length after three or four months into a spitting of much bloud. Although shee was scarse ten years old, I let her bloud presently in the foot of that side on which shee had been troubled with the Fistula, and purging her body, and laying on a cautery near the place, in which the Fistula had been, I easily freed her in this manner from imminent danger of a Consumption. This spitting of bloud happened from no other cause, but that sharp and cholerick matter, which when it could no longer find a way out by the Fistula, got up afterwards to the Lungs through the branches of the Hollow-vein. But *Hippocrates* sayes expresly, that there is danger of a Dropsie, or Consumption to follow, because it sometimes falls out, that neither of these happen, but rather some other disease insues, as it happened to *Alcippus*, who fell into a madnesse, and from that into an acute Feaver: sometimes also the bloudy flux follows, and other mischiefs. Sometimes also it happens, that they who are so cured, are preserved still in health, by abundance of urine, sweatings, remedies, and a good rule of diet.

CHAP. II.

Treats of the superior, or ascendent Trunk of the Vena Cava, *or Hollow-vein, and the branches which it scatters through the Head.*

WEE are now to consider the other vein, which as we told you is called *Cava*, the Hollow one [a], which spreads it self much wider, then the Gate-vein, as being distributed throughout the whole body. For its office is to nourish all those parts of our body, which conduce not to the concoction of the food, and those parts being spread far and wide, it is necessary, that the Hollow-vein also be very large, and extended to a great length: and because they ought to be nourisht with a thinner, and more elaborate bloud, and not so thick and faculent, as that wherewith the Stomach, Spleen, and Kall are nourisht; therefore the bloud which the Hollow-vein makes, and carries, is also more pure, thin and sincere. The use of the Hollow-vein.

In delivering the History of this vein, although we are not of their opinion, who derive its beginning either from the Liver, or heart, yet because we must begin our Treatise of it somewhere, we thought fit to follow the received custome of Anatomists, and so for perspicuities sake we shall alwayes speak of it, as if it took its birth from the Liver. It may be added, that it spreads certain roots as it were in the Liver, just like the Gate-vein, in the History of which when for that reason we took our rise from those roots, we may not without cause begin thence also with the Hollow one. But this vein although it run directly through the whole Trunk of the body, and make one very notable stock [D] that is drawn out through the middle, and lowest belly, like one straight line continued, or rather in manner of a channell, or conduit pipe, is notwithstanding wont to be divided into two by reason of the Liver, and so one to be called the Ascendent Trunk, the other the Descendent. For indeed that is not true, to which many perswade themselves, that The method to be observed in the History of this Vein.

that the Hollow-vein in its going forth from the Liver, like the great Artery, when it comes out of the heart, is cleft into two Trunks; but if hereafter they be called Trunks by me, you muſt beleeve, that I do it only for orders ſake in teaching. The Aſcendent therefore or upper Trunk [A.D.] is that which ſtands about the Liver, and is terminated about the *Jugulum*, or Hollow of the Neck; but that is called the Deſcendent one [T.V.] which is beneath the Liver, and reaches down as far as the Legs. For both of them are afterwards divided into branches, of which they of the Aſcendent [m and q] are carried upwards to the Head, as the Jugular or Neck-branches; or to the Arms, as the *Brachiales* [G and I] or Arm-veins; theſe of the Deſcendent Trunk to the Legs, and are called the Crurall branches. [T]. We will ſpeak therefore of all theſe in order, ſo that we firſt deliver the Hiſtory of the Aſcendent Trunk, then of its branches, that grow up partly to the Head, partly to the Arms, after that we will come to the Deſcendent Trunk, and its branches, that are digeſted into the Legs.

The Aſcendent Trunk.

As therefore we have ſaid, that many little Veins like roots grew out of the Hollow ſide of the Liver, which alwayes by degrees inſerted into the greater veins, and all of them at length meeting together about the middle of it did make a Trunk; ſo in the ſame manner out of a circuit of the Convex ſide of the Liver a numerous propagation of veins iſſues forth, which afterwards meet together in one Trunk. This Trunk makes its way through the nervous part of its midriffe on its right ſide, and paſſing through it goes undivided to the *Jugulum*, or Hollow of the Neck, and becauſe it climbs upwards, it is commonly called the Aſcendent Trunk by them, who conceive that the Hollow-vein riſes out of the Liver. It is much greater then the Deſcendent, becauſe the upper parts are nouriſhed by it alone; but almoſt all the inferior parts, that are contained in the loweſt Belly, by the Gate-vein. But although it be not parted into any branches, untill it come to the *Jugulum*; yet before that it ſpreads ſome propagations at its ſides, and of thoſe, three notable ones.

Propagations of the *Aſcendent* Trunk. *Phrenica.*

The firſt [e e] is that which is called *Phrenica*, or the vein of the Midriffe, on either ſide one, and is diſtributed throughout the whole Midriffe, which is called ὑφρὴν, with a numerous iſſue, ſending little branches to the neighbouring *Pericardium*, or purſe of the Heart, and the *mediaſtinum*, or partition of the Cheſt; which when it has now got above, and entred the Cheſt, it inclines a little to the left hand, and enters the *pericardium*, and being hidden very cloſe over againſt the eight rack-bone of the Cheſt, is very ſtrongly infixt into the Right ventricle [C] of the heart; that *Ariſtotle* did not without cauſe gueſſe, that it ſprung from hence. But before it be ſo infixed, it ſends out another propagation [b b] which is a notable one, and extends itſelf by the hinder part of the Heart, and the left ſide of it, towards the forepart, compaſſing the *baſis* of the Heart like a Crown, from whence it is called *Coronaria*, or the Crown-vein of the Heart. This ſcatters many branches through all the outer ſurface of the Heart, but eſpecially through the left ſide, as that which needed a more copious aliment then the right ſide, becauſe of the continuall, and greater motion there. But becauſe the fleſh of the Heart is hard, and ſolid, it ought therefore to be nouriſht with a thicker bloud, from whence it is, that this branch grows out of the vein, before it enters the Heart, to wit, when the bloud is ſomewhat thicker, and not yet attenuated in the cavities of the Heart. Near to the originall of this there is a little valve, or floud-gate, which hinders the bloud from flowing back to the Hollow-vein, as it might eaſily do by reaſon of the continuall motion of the Heart. When the Hollow-vein has now gotten above the Heart, it becomes leſſer, and perforates again the *Pericardium*, and forſakes the Rack-bones of the Back, and being got above the Gullet, the rough Artery, and the *aorta*, or Great Artery, (which lean ſo upon one another, that the Gullet takes hold of the bodies of the Rack-bones, the rough Artery lies upon that, and the *aorta* again upon this) it climbs upwards through the midſt of the diviſion of the Lungs, where the right part is ſeparated from the left. But becauſe by this means it could not get to the Back, and the little branches, if it ſhould have ſent forth any ſuch, had been very liable to danger of breaking, being ſo hanged up; therefore it ſends forth a third propagation [c c] as ſoon as it is got out of the *Pericardium* or purſe of the Heart.

Coronaria.

Ἄζυγος.

The Greeks call this vein ἄζυγος, the Latins *ſine pari*, or *carens conjuge*, without a companion, or wanting a mate, becauſe in a man there is but one, and it has no companion, or mate on the left ſide, as other veins have; though in creatures that chew the cud, it is double, and plainly to be perceived of both ſides. But it iſſues forth about the fifth Rack-bone of the Cheſt out of the hinder part of the Hollow-vein, and the right ſide, and goes downwards, not directly, but inclining a little toward the right hand is as it were reflected backwards to the Back-bone: but as ſoon as it reaches the eighth, or ninth rib, it is cleft above the Spine of the Back into two branches, which running downwards paſſe through the diviſion of the Midriffe, which is betwixt its two productions, and ſo are ſpread abroad into the loweſt Belly: Of theſe the left, which is ſometimes the greater, hiding itſelf about the tranſverſe Proceſſes of the Rack-bones, and under the left production of the midriffe and the originall of the firſt bending muſcle of the thigh, is inſerted into the left Emulgent, either near to its beginning, or (as it oft happens) into the middle of it. But the right, running on likewiſe under the membranes

branes about the transverse processes of the right side, and the right production of the *Septum* or Midriffe, and the beginning of the same first bender of the thigh, which keeps the right side, is implanted sometimes into the very Trunk of the Hollow-vein, sometimes into the first vein of the Loins. And we are indebted for this observation to the learned *Fallopius*, who would have the matter that is gathered together in the Chest, whether it be watery, or purulent and corrupt, or sanguinous, to be evacuated by the benefit of the left branch of this vein; of which notwithstanding we will say something briefly in the following Book. But this vein in its journey downwards shoots forth twigs of both sides, as well right, as left, of which the right are more notable, and larger, of which there are numbred almost alwayes ten; which run out to as many distances of the lower ribs, and make the inferiour Intercostall veins. But I say they are almost alwayes ten, because it happens very seldom, that all the distances of the ribs receive branches from this vein, the two uppermost, to wit, the first and second distance getting their surcles or twigs from the fourth branch, that is presently to be mentioned. But these twigs run straight forwards near to the lower side of the ribs, where there are cavities cut out for them, as we have taught in the second Book. And truly this place is diligently to be taken notice of by Students in Chirurgery, because of the opening of the Chest in the disease called *Empyema*, that they may know that incision is to be made in the uppermost place of the rib, because in the lower the vessels would be harmed to the great indangering of life. But these veins do not run through the whole length of the true ribs, but are terminated together with the bony part. But the propagations of the Mammary vein nourish the six distances between the gristles of the seven true ribs, as we shall tell you by and by. Yet in the Bastard ribs they run even beyond the Gristles towards the *Abdomen* or Paunch, into whose Muscles they insinuate themselves. But there are certain other little branches propagated from the same vein, by which nourishment is derived to the marrow of the Rack-bones, and the Muscles, to wit, those about which they are carried: some also are implanted into the *Mediastinum* near to the back. This vein *sine pari* without a companion, being thus constituted, the Hollow-vein ascends to the *Jugulum*, or Hollow of the Neck [D] being supported by the *Mediastinum*, and a certain soft and glandulous body, which the Greeks call θυμὸς, and is placed in the highest part of the Chest, to defend the divarications of the veins there hanging up from all danger of breaking.

And here the Hollow-vein is first divided into two notable branches [E E] from which all those veins arise, that run as well to the Head, as to the Arms, or to certain Muscles of the *Abdomen*. Of these one goes to the right side, and the other to the left, which as long as they yet are in the Chest, are called *Subclavii*, subclavian branches, because they go under the *clavicula*, or Coller-bones; but as soon as they have gotten out of the Chest, and attain to the Arm-hole, they are named *Axillares*, the Axillary-veins [F]. From both of them very many propagations issue forth, some of which arise from their upper part, and some from their lower. In our recitall of them we will observe this order, that they which are neerest to the Trunk, shall be first mentioned by us; and they last, which are farthest from it. *The division of the Hollow-vein into the two Subclavian branches.*

The first propagation then issues out near the very root of the divarication or division of the Trunk, and is called *Intercostalis superior*, the upper Intercostall vein; [e] there is of either side one, which being very little, and descending along by the roots of the ribs, as far as to the third rib, sends two twigs [f f] overthwart, like the *vena sine pari*, to the two distances of the upper ribs. But if the *vena sine pari* sends its propagations to all the distances (as it sometimes happens) then it is wanting not without cause. Sometimes the same vein arises from the Trunk of the Hollow-vein, before its division into the subclavian branches. *Propagations from the lower part of the Subclavian-branches. Intercostalis superior.*

Another vein [g] sometimes arises from the fore-part of the bifurcation; sometimes from the root of the Subclavian branch, and is double, of either side one: sometimes also only one grows out of the middle of the Trunk, before it be divided; which at length, when it has attained unto the Breast-bone, is parted into a right, and a left branch. For Nature is wont to sport, as sometimes in its other works, so especially in the rise of veins, so that they are not spread in all bodies after the same manner. But this is called *Mammaria*, the Mammary vein, which, when soever it arises, going toward the fore-part, strives to get up to the higher part of the Breast-bone, and descends by the sides of it, and when it is come to the Breast-blade, about its sides goes out of the Chest, and runs on directly under the right Muscles of the *Abdomen*, even to the Navill, near to which it is joyned by an Anastomosis, or inoculation [10] with an Epigastrick-vein [9] that ascends and meets it; by the benefit whereof arises that notable sympathy betwixt the womb, and Breasts of women, of which we shall speak more hereafter in the eight Chapter, when we shall insist on that History of the Epigastrick-vein. But before it leave the Chest, in its descent, it distributes one branch a piece to the six distances betwixt the Gristles of the seven upper true ribs, of either side, which are terminated with the Gristles near to the end of the bony part of the ribs, in which place we told you that the branches of the vein *sine pari*, (with the extremities of which these are joyned) were ended. From these *Mammary.*

veins,

veins, which are diſtributed in this manner to the diſtances of the Griſtles, ſome others very worthy of our notice do ariſe, which are diſſeminated both into the Muſcles, that lye upon the Breaſt, and into the Paps. Near to theſe a third [h] ariſes, and ſometimes alſo grows out of the Trunk, which is called *Mediaſtina*, becauſe it ſpreads itſelf into the *Mediaſtinum*, or membrane that cloſes up the cavity of the Cheſt, being extended all along by it, with the left Nerve of the Midriffe. The fourth [i] commonly called *Cervicalis*, or the Neck-vein, is a large vein of both ſides which running obliquely, upward, and backward, to the Tranſverſe proceſſes of the Rack-bones of the Neck, and climbing up through their holes, (from whence perhaps it might be better named *Vertebralis*) affords ſprigs to the Muſcles, that lye next upon the Rack-bones. When this vein has got above the Tranſverſe Proceſſe of the ſeventh Rack-bone, it derives a notable branch of the *Sinus* or *Canale*; in the Neck, through the hole that is made for the outlet of the Nerves; and then another, when it comes above the Proceſſe of the ſixt Spondyll, or Rack-bone, and again another, when it has left the fifth Spondyll, untill at laſt it comes to the Proceſſe of the firſt Rack-bone, which notwithſtanding it does not touch, much leſſe does it paſſe into the Skull, (as *Veſalius* would have it) near which it goes partly to the ſame *ſinus* or canale, partly it is diſtributed into the hinder parts of the Neck. For there are two long *ſinus* filled with bloud, which are made out of the hard membrane of the Brain, one of each ſide, being placed at the ſides of the marrow of the Neck. From theſe little branches are diſtributed, which nouriſh the marrow of the Back-bone, and the neighbouring parts; they begin about the Juncture of the Head with the firſt Rack-bone, and end near to the ſeventh Rack-bone of the Neck. Theſe two *ſinus*, of which one is of the Right, the other on the Left ſide, have ſome communion betwixt themſelves by a little pipe, and that a ſhort one, which is derived overthwart from the one to the other, for the moſt part about that region of the Neck, which is betwixt the ſecond, and third Rack-bones. At laſt there is a fift vein [l] which ariſes from the hinder part, called *Muſcula inferior*, or the lower Muſcle-vein, which is diſtributed in many branches to the Muſcles in the lower part of the Neck, (and ſo extending the Head and Neck, from whence the vein might be rightlyer called *Cervicalis*, or the Neck-vein) and alſo to thoſe in the higher part of the Cheſt near to the Rack-bones.

Mediaſtina.

Cervicalis.

Propagations that ariſe from the upper part of the Subclavian branches.

Jugularis interna.

Externa.

From the upper part of the Subclavian branches, whileſt the Hollow-vein is yet in the Cheſt, three propagations iſſue forth, two of which do very well deſerve to be noted, which take their way upward, under the Muſcles that bend the Head. The former of the two looks more inwards, and is called *Jugularis interna*, the inner Jugular vein: the other inclines to the outer parts, and is commonly called *Jugularis externa*, the outer Jugular vein. For both of them ariſe near to the *Jugulum*, or Hollow of the Neck, and aſcend by that to the Head. The inner is greater, and the outer leſſe in a man; but in Brutes 'tis contrary. But when almoſt all Appellations are derived, and that beſt, not from the place, through which the veins paſſe, but from their inſertion; perhaps they might be rightlier named *Cephalicæ* or *Capitales*, Head-veins. The inner Jugular vein [m] takes its originall near to the joint, by which the Clavicles or Pate!-bones are tyed to the Cheſt, and as ſoon as it ariſes, is joined with the *arteria carotis*, or ſleepy Artery, and a Nerve of the ſixt pair, as companions in its journey, at the ſide of the rough Artery, and climbing to the Chops, about the middle of the way is parted into two branches, of which one is called the outer, the other the inner branch. The outer is ſo called, becauſe it comes not into the inner parts of the Head, but being divided into two at the corner of the lower Cheek, diſtributes one branch to the Chops, and the other near to the Ears, and Face. The inner branch, all the way, is joyned to the *Arteria Carotis*, or ſleepy Artery, even to the baſis of the Skull, whither when it is arrived on the backſide, it is likewiſe cleft into two branches, but of unequall bigneſſe. For the firſt [n] is greater and more hinderly, being carried backward obliquely, which having propagated ſome twigs to the Muſcles under the Gullet, and in the forepart of the Rack-bones of the Neck, through the ſecond hole of the *occipitium* or Nowl-bone enters the Skull with the leſſer branch of the *Arteria Carotis*, through which ſaid hole the ſixt pair of the Nerves deſcends: and thus this branch enters the firſt [1] and ſecond [2] *ſinus* of the thick membrane. The ſecond branch [p] being ſmaller, and more to the forepart, quite forſaking the *Arteria Carotis*, or ſleepy Artery, goes to the forepart of the Head, and after that by the way it has beſtowed a Circle not very notable upon the Organ of hearing, it enters the Skull through the ſeventh hole of the Wedg-bone, or *Os cuneiforme*. This is diſperſed through the *baſis*, and ſides of the thick membrane, with a numerous iſſue of branches, the prints whereof are obſerved in the inner ſurface of the bones of the forepart of the Head, as we have ſaid above in the ſecond Book. Wee will call theſe two branches, becauſe they go to the brain, *Encephalici*, as if you ſhould ſay *Cerebrales*, of the Brain, and that ſhall be the greater *Encephalicus*, this the leſſer. The externall Jugular vein [q] aſcending under the skin, and the *muſculus quadratus*, or Square-Muſcle, that draws down the Cheeks, by the ſides of the Neck, when it comes to the Ear, is cleft into two branches [r] one of which I call *Profundus*, the deep one, becauſe it enters the Muſcles, and retires into

Jugularis Externa.

Profundus.

into the more inward parts, the other *Cutanea* the Skin-branch. The deep or inner one [s] in its first divarications meets with Glandules about the Chops, and sends forth propagations worthy of our notice to the *Larinx* or Throttle, and the Glandules, that grow to it, as also to the Muscles of the Chops, and of the bone called *hyoides*, among which that which creeps all along under the tongue, is a notable one, and is scattered into many little branches, which are seen, if the Tongue be lift up, even before dissection. From this deep branch three others arise, which enter into the inner parts of the Head, and the Skull. The first, after it has spread little branches into the Chops, and Mouth, enters the Skull, through the first hole of the Temple-bone. The next [e] passes out of the forepart of the eye through the second hole of the Wedg-bone, at which the second pair of Nerves gets out, and runs with some circles through the thicker Membrane upwards. The third is scattered out of the breadth of the Nostrils through the hole of the *Os cribrosum*, or sive-bone into the same Membrane. These two nourish this forepart, to which the third *sinus* reaches not, but ends near to the partition of the Mamillary Processes. But the outer or Skin-branch [u] creeping by the skin of the Head, and stayed up with the Glandules under the Ear, which they call *Parotides*, is divided into two branches; of which the Anteriour [x] is carried upward obliquely through the Cheeks to the inner corner of the Eye, distributing little branches by the way to the Nose; and going on to the Eye-brow, is joyned with the remainder of the branch of the other side, and makes the Strait-vein, which they call *vena frontis*, the Forehead vein, [y] and which in madnesse is opened to very great advantage. To this the *Satyrist* alludes, when speaking of a certain foolish fellow, hee sayes,----*Medianam pertundite venam.*

Three branches entring the skull.

Cutanea.

The other or Posteriour branch is carried behind, and sends branches to the Temples [z] and skin of the Back-part [α] of the Head. A third vein, which arises out of the upper part of the Subclavian branches, is commonly called *Musculo superior*, the upper Muscle-vein, in relation to another of the same name arising out of the lower part. It issues out near to the externall Jugular vein, and is dispersed into the Muscles, and skin of the back-side of the Neck, in regard whereof we shal not do amisse to cal it *Cervicalis superior* or the higher Neck-vein [β]. But now let us return to the distribution of the Subclavian-vein, from which we have digrest. This vein, as soon as it gets out of the cavity of the Chest, is called *Axillaris* [F], and when it comes to the Arm-pit, is divided into two notable branches, called *Cephalica* or Head-vein [G] and *Basilica* [I], which are afterward dissеminated throughout the whole Arm. But before the Axillary-vein be thus divided, it sends forth two twigs: the first [γ] is called *Scapularis interna* the inner Blade-vein, and is distributed through the Muscles on the inside of the Shoulder-blade: the other [δ] is named *Scapularis externa*, or the outer blade-vein, it is a pretty big one, and is implanted into the Muscles of the outer, and gibbous part of the same Shoulder-blade. But the vein *Basilica* also, before it enters the Arm, shoots out two propagations; one called *Thoracica superior*, or the upper Chest-vein [ε] because it arises out of a higher part then the following, it is a very notable one, and runs through the inside of the pectorall Muscle that brings the Arm forward to the Brest; it distributes branches also to the other Muscles of the Brest, as also to the Skin of the Dugs in women. The other is called *Thoracica inferior*, the lower Chest-vein [ζ], a great and notable one likewise, which descending along the side of the Chest is distributed especially through the third broad Muscle or *Latissimus* that moves the Arm backward, scattering many little branches from itself, which afterwards are joyned by *Anastomosis* or inoculation, with the branches of the vein *sine pari*, that fall out of the Chest. And this vein sometimes grows out of the former, or the upper Chest-vein. These branches being thus distributed, the Axillary-vein reaches into the Arm.

Musculo superior.

The division of the Axillary vein into two branches.

Its propagations before its division.

Scapularis interna.

Externa.

Thoracica superior.

Thoracica inferior.

CHAP. III.

Shews how the Axillary-vein is distributed through the Arm.

THe Axillary-vein [F] therefore is cleft into two branches, as soon as it comes near to the Arm, but those branches are of different bigness. For the upper [G] which they call *Cephalicus*, the Head-branch, is smaller; but the lower vein [I] called *Basilica*, is almost thrice greater. The Cephalick also is as it were wholly just under the skin, & sinks not with above one branch into the deeper retreats of the Muscles; wherefore it has neither Artery, nor Nerves for its companions, they being addicted to the more inward rooms of the body. But the Basilick-vein partly creeps on under the skin, partly hides itself under the Muscles, and therefore it ought with good reason to exceed the other in bigness, as being destined for the nourishment of more parts. It hath both Nerves, and Arteries as companions in its journey, which is the cause, why upon the cutting of this vein the bloud spins out with a force; but of the

The division of the Axillary vein.

contrary, the Cephalick being cut, it comes forth ſoftly: which we ſee ſome Phyſitians unskilfull in diſſections, ſtanding by whileſt the vein is opened, fooliſhly refer to the ſtrength, or weakneſſe of the mind, or body. We are now to ſpeak briefly of the manner of the diſtribution of both theſe veins through the Arm, beginning from the upper, as the leſſer branch.

The Cephalick vein.

The *Cephalica* [G] therefore is called by *Veſalius Humeraria*, or the vein of the Arm, becauſe by the Arm it deſcends into the Hand; by others *Cubiti exterior*, the outer vein of the cubit, from its ſituation, becauſe it runs on the outſide of the Cubit, as the *Baſilica* contrariwiſe does on the inſide. By ſome later writers it is commonly called *Cephalica*, the Head-vein, becauſe it is wont to be opened in diſeaſes of the Head, through the error of the Ancients, who thought ignorantly, that it ariſes from the external Jugular vein, and therefore empties the bloud immediately out of the Head. But it ariſes from the upper part of the Axillary vein, & climbing over the Tendon of the *Serratus minor*, or leſſer Saw-Muſcle, that bends the Shoulder-blade forward to the Breaſt, it runs betwixt the Muſcle called *Deltoides*, which lifts up the Arm, and the beginning of the Pectorall Muſcle, which brings it forward to the Breaſt, where it ariſes from the Clavicle or Coller-bone, and ſo it runs down by the Arm to the outſide of the firſt Muſcle that bends the Cubit, which they call *Biceps*, or the double-headed Muſcle; by reaſon whereof the more learned Chirurgeons have wiſely uſed to make iſſues betwixt the Muſcles *Biceps*, and *Deltoides*; for iſſues ought alwayes to be made at the ſeat of ſome notable vein, that the matter may more eaſily be voided out. But although this vein be not divided into branches, whileſt it is thus carried down by the upward part of the Arm, yet it ſcatters ſome twigs [u and e] of both ſides into the aforeſaid Muſcles, and the skin. At length when it is come to the Cubit, it runs under the fleſhy Membrane, as a vein under the skin ſhould, and ſo preſents itſelf to the ſight without diſſection.

Three branches of the Cephalick-vein.

But about the very joint of the Cubit at the externall protuberation of the Arm, it is wont to be divided [H] for the moſt part into three branches, an outer, an inner, and a middle one. The two former run under the skin, the third deeper. The firſt or middle one, [i] which is often wanting, is very little, and deeper, and penetrates into the ſubſtance of the Muſcles, eſpecially of thoſe two, that bend the ſecond, and third joint of the fingers, as alſo of the long *ſupinator* of the *Radius*, or wand of the Arm. The ſecond [x] and inner, and chief of the three branches is carried down obliquely under the skin, and joins with the inner branch of the *Baſilica*, three fingers below the joint of the Cubit, with which it makes up the vein, that Phyſitians call *Mediana*, the middle vein [λ]. This running down obliquely by the middle Region of the Cubit, diſtributes many Circles to the *Radius* or wand, and at length itſelf is divided into two leſſer branches; of which the outer [ρ] goes to the inſide of the wriſt, toward the thumb; the other and inner [σ] runs to the fore, and middle fingers. The outer of theſe is called by ſome *Cephalica manus*, and is opened to very good purpoſe in diſeaſes of the Head, or Teeth. Now the third branch [ν] or outer Cephalick-vein climbs up to the Muſcle called the long *ſupinator* of the *Radius*, or wand, diſperſing divers little veins into the skin, and ſo is carried obliquely [τ] through the *Radius*, or wand, and having attained to the middle of its length enters the outſide of the Cubit, and in that ſame place is joyned with a little branch [τ] of the Baſilick-vein; being united thereto it goes on to the outſide of the wriſt; and diſtributes veins to that part of the Hand, which lies before the little, and Ring-fingers, as alſo to the fingers themſelves. This vein, eſpecially that, which reſpects the little Finger, is commonly called *Salvatella*, and the Section of it is much commended by Practitioners in Phyſick in melancholy diſeaſes. Which being ſometimes called in queſtion, and I having obſerved, that experience does favour thoſe Practitioners, endeavoured to find out the cauſe, and found that there are many inoculations here of this vein with the Arteries, as the inoculations are uſually more frequent about the extream parts, as being more removed from the fountain of heat, and therefore wanting a hotter, and more ſpirited bloud. This vein therefore being cut, becauſe the Inoculations are ſo near, it cannot be, but that the bloud of the Arteries ſhould be alſo let out, which cannot be ſo well done by opening the veins of the Cubit, becauſe the *Anaſtomoſes* or Inoculations are ſomewhat more diſtant from the place, in which the vein is opened. And hence it is, that the bloud, which is emptied out of the Hand, is much fairer and redder, then that out of the Arm, becauſe the Arterious bloud there alwayes runs out together with that of the veins. But there being ſix times more Arteries, then there are veins in the Spleen, it is neceſſary, that its diſeaſes be much helped, when the peccant bloud is drawn out of thoſe veſſels, wherein it was.

Salvatella.

The baſilick vein.

The other branch of the Axillary-vein, that is the inner, and greater, is the *Baſilica* [I] which according to its ſituation in different arms hath found different names among writers practiſed in Phyſick. For in the right arm it is called *Hepatica* or the liver-vein, but in the left *Splenica*, or the ſpleen-vein. They chooſe that to be opened in diſeaſes of the liver, this in diſeaſes of the ſpleen. But it iſſues forth under the armpit, and diſperſing many propagations to the Glandules, that are frequent thereabout, it is carried down by the upper part of the Arm to the ſide of the double headed-Muſcle, or *Biceps*, between the Muſcles

that

that bend and ſtretch out the Cubit, and not far from its egreſſe out of the Cheſt, is divided [K] into two notable branches, of which one is called *Profundus* or deep, the other *Subcutaneus*, or branch under the skin, from their ſite, and progreſſe. The deep one or *Profundus* [L], which for the moſt part is the thicker, all the way it goes, penetrates into the more inward parts of the Arm; having the Axillary Artery, that runs into the Arm, every where for its companion, as alſo the fourth branch of the third Nerve of the Arm. But it is carried betwixt the two Muſcles, which bend the Cubit, and, having paſt its joint, is cleft [M] into two branches; of which the outer [N] near to the *radius* or wand, (from whence it might be called *Radialis*) goes down to the Hand, and ſcatters little branches toward the Thumb and Fore-finger, as alſo the middle one; but the inner branch [O] paſſing near to the bone of the Cubit, (from whence it deſerves the name of *Cubitea*) diſtributes ſmall branches to the middle, and little fingers; but as the outer ſends its propagations to the Muſcles on the outſide of the Hand; ſo the inner to thoſe on the inſide. The other is the branch *Subcutaneus*, or under the skin [P] which is carried down by the inſide of the Arm, ſcattering divers little branches to the skin, and parts adjacent, but when it is come to the inner protuberation of the Arm, it is divided [Q] into an outer, and inner branch, like as the Cephalick is. The inner [R] is carried down obliquely, beneath the bought of the Arm, and being united with the inner branch [κ] of the Cephalick, makes the vein called *Mediana*, [λ] of which we ſpake before. But the outer [S] near to the inner protuberation of the Arm being divided into two branches, is carried by the greater along the Region of the *ulna* or ell downward to the wriſt, and ſcatters itſelf into the little Finger, but by the other it is derived to the inſide of the Hand.

The branches of the baſilick vein. *Profundus.*

Subcutaneus. Its diviſion into an outer and an inner branch.

But in this place it is worth our pains to advertiſe with other the moſt learned Anatomiſts; that it ought not to be believed, that the ſame order, and courſe of veins is to be found in all men; when the diſſection of bodies does demonſtrate, that ſcarſe two in a thouſand do accurately obſerve the ſame diſtribution of the veins. Wherefore we ought not to be ſo ſcrupulous in chooſing out places for the openings of veins, as ſome that are unexperienced, are wont; but to chooſe that vein eſpecially, which may be moſt ſafely opened, becauſe it is beſt ſeen. For ſometimes the Cephalick or Head-vein is ſo ſmall, that it can hardly be diſcerned; and ſometimes on the contrary the Baſilick is ſo. Wherefore he ſhall do beſt, who will rather follow wiſe counſell, then the ſcrupulous opinion of unskillfull men.

CHAP. IV.

Explains the lower, or deſcendent Trunk of the Hollow-vein.

WE have done with the upper Trunk, and branches of the Hollow-vein, it remains now, that we treat alſo of the lower. Nevertheleſſe (as we have above alſo admoniſht) they are not indeed two Trunks, as *Galen* would have them, but one only which reaches in one continued line from its diviſion about the fifth Rack-bone of the Loins [V] as far as to the *Jugulum*, or Hollow of the Neck [D]: but, for methods ſake in teaching, we thus divide it by reaſon of the Liver, which ſtanding as it were in the middle of it, ſeems to part it into an upper, and a lower Trunk. As therefore that is the upper one [AD] which runs up from the Liver to the Hollow of the Neck; ſo that is the lower [TV] which beginning at the ſame Liver is terminated at the *Os ſacrum*, or Holy-bone. And as the upper did run on undivided through the Cheſt, ſcattering only ſome propagations at its ſides; ſo the lower alſo ſlides down intire through the whole *Abdomen*, or paunch, only ſome twigs ſprouting from it. But when it has attained to the fifth Rack-bone of the Loins, it is cleft into thoſe two notable branches called *Iliaci* [XX] as the upper is into the Subclavian, which Iliacall branches afterward reaching into the Legs make the Crurall-veins; as the ſubclavian carried into the Arms make the *Brachiales*, or Arm-veins. Let us ſpeak therefore in this Chapter of the Trunk, and its propagations, as long as it yet is in the lower belly. Then let us come to the crurall branches.

The *Inferiour* Trunk of the Hollow-vein.

From the deſcendent Trunk then [TV] before it part into branches, ariſe four veins. For as ſoon as it is come forth from the hinder part of the Liver, it declines to the right ſide of the Back, and ſends forth a propagation from its own left ſide which they call *Adipoſa ſiniſtra*, the left fatty vein [υ on the left ſide] becauſe it paſſes to the fat and outer membrane of the Kidneys, which ariſes from the *Peritoneum* or Rim of the Belly, as alſo to the Glandule, that grows above the Kidneys. There is another [υ on the right ſide] anſwering to this on the right ſide, but which does very ſeldom grow out of the Trunk, but rather from the upper ſide of the middle part of the Emulgent vein; and becauſe it is diſtributed in the ſame manner as the left is, it is called *Adipſa dextra*, the right Fatty vein. Yet ſometimes you may ſee the contrary alſo to happen, and this right vein to

Four propagations ariſing from the Trunk before its diviſion. *Adipoſa.*

come forth of the Trunk, and the left out of the Emulgent. For there are divers ſportings of nature to beſeen in the veins; and you cannot eaſily meet with a dead body, in which you may not find ſomething new, and differing from others. After this the Hollow-vein paſſing on, when it comes beyond the middle of the back, about the firſt Rack-bone of the Loyns, it brings forth a ſecond pair of veins [♀] very notable, which haſtens directly to the Kidneys, upon whoſe ſubſtance it is wholly ſpent. And hence it is called *Renale*, the pair of Kidney-veins from its inſertion; but from its uſe *Emulgens*, becauſe the Kidneys ſeem by this pair to milk out the wheyie or ſerous moiſture in the bloud, and to draw it to themſelves. It is therefore very thick, but yet ſhort, and not of equall length, nor riſing directly oppoſite each to his fellow. It is ſhort, becauſe it did not need length, which for the moſt part is given by nature to veſſels for ſome previous preparation. It is unequall, becauſe it was fitting the left ſhould be longer then the right, by reaſon that it was neceſſary to bring the ſpermaticall vein out of it. But the beginning of both anſwers not directly one to another, leſt one ſhould be hindered by the action of the other. And the left is higher then the right, becauſe the left Kidney is alſo ſeated higher, then the right. But the Emulgent branches, as ſoon as they ariſe out of the Trunk, do not preſently go to the cavity of the Kidneys, but are firſt divided into two greater branches, and ſo, accompanied with Arteries, enter the concavous ſide of the Kidneys, and afterward being broken into leſſer branches are ſcattered quite through the whole ſubſtance of the Kidneys, and at laſt determin with their ſmall hairy ends in certain fleſhy proceſſes, which they cal *Mammillares*. Theſe veins do ſerve not only for the bringing of nouriſhment to the Kidneys, but alſo for the carrying down of the ſerous moiſture to thoſe fleſhy Proceſſes called *Mammillares*, through which it is ſtrained into the pipes of the Ureters, and then gathered together into that cavity of theirs called the *Pelvis*, and ſo drops down by little and little into the bladder, as we ſhall ſhew, when we open the Hiſtory of the Kidneys. And here the place is to be noted, in which the ſtones of the Kidneys are wont to be generated, which is not in the Emulgent veſſels, I mean veins, or Artery; but rather in the very cavity of the Kidneys, or in the *Pelvis*, and pipes of the Ureters. For in theſe if a viſcous matter be at any time received, either it is hardened there by reaſon of a notable heat, or elſe through cold is congealed into gravell or ſtone. For this matter is not only a crude, and uncocted kind of bloud, which like ſnivell ſometimes is wont to abound in the maſſe of bloud, but oftentimes alſo that excrementitious phlegm which falls down from the Head, through the veins and Arteries, both into the Hollow-vein, and the great Artery, and ſometimes into the Stomach, and Guts. Of which this ſeems to be a manifeſt ſign, that they who are ſubject to diſeaſes of the Stone, are very often troubled with rheumes, and pains of the Colique; of which whilſt ſome perſwade themſelves that it is cauſed by wind, dayly experience hath taught me, that it comes from phlegm; becauſe I have obſerved, that they, who are troubled with the Stone in the Kidneys, had their *Colon* or Colique-gut alwayes ſtuft with plenty of this phlegm, and that this being taken away, the Stone has been no longer bred. And therefore oft-times I give ſcouring Clyſters, and ſuch as gently purge phlegm, not only to ſuch as have the Stone already, but alſo to ſuch as are threatned with the breeding of it, with a great deal of benefit to the Patients. But all thoſe things are perpetually to be avoided, which drive out the Stones, as well becauſe moſt of that nature are hot, as alſo becauſe they are able to drive down the crude matter plentifully to the Kidneys. We thought fit therefore to inſiſt upon this, that we may accommodate the ſtudy of Anatomy to the very practiſe of Phyſick; eſpecially ſeeing that the place, wherein the Stone is bred, is not commonly known, becauſe the moſt famed *Fernelius*, whom the greateſt number of Phyſitians does for the moſt part follow, *Lib. 6. Patholog. c. 12.* thinks that ſmall gravell is bred in the proper ſubſtance of the Kidneys, and waſhed from thence by the flowing of the Urine, and carryed into the cavity, and ſo the Urine full of gravell ſlides down through the Ureters into the Bladder. But if any one enquire alſo the cauſe, why the left Kidney is more ſubject to the Stone, then the right; we muſt conclude, that this happens, becauſe the Colique-gut lies more upon the left Kidney, in whoſe cells this phlegm, of which we ſpake, abounding, either it ſweats through the pores, and is ſuckt into the Kidneys, or elſe by reaſon of its nearneſſe, the Kidneys are exceedingly cooled; experience having often taught us, that this kind of phlegmatick matter is indeed actually exceeding cold in the body, as they have ſufficiently perceived, who have voided it in great plenty by Stool. After this there follows a third pair [♂ and ♃] called *ſpermatica*, or *ſeminales*, the ſpermaticall, or ſeeds veins, becauſe they carry down matter for making of the ſeed. Theſe differ in their originall. For the left [♃] ariſes from the inſide, and middle part of the Emulgent, and communicating ſome ſurcles to that part of the *Peritoneum*, or rim of the belly, which covers the Muſcles, that lie in the Loins, it goes faſt by the ſaid *Peritoneum*, and deſcends obliquely; but, when it has attained to the *Oſ pubis*, or the Share-bone, riding over it, it paſſes through the *Peritoneum*, and holes of the oblique and tranſverſe Muſcles of the *Abdomen*, with whoſe proceſſes being ſuſtained it is concocted into certain

Emulgentes.

The place in which the ſtones of the Kidneys are bred.

VVhy the left Kidney is more ſubject to the ſtone, then the right.

Spermatica.

varicous

varicous circlings, which are joined with the ſpermaticall Artery by *Anaſtomoſes* or Inoculations, and at length it ends in the Teſticle of its own ſide. But the right ſpermaticall vein [χ] ariſes not out of the Emulgent, but the Trunk itſelf, and the forepart of it, a little beneath the Emulgent-vein, and afterwards obſerves a like courſe with the former. And thus they are in males, though we may obſerve nature oftentimes varying in them: but in women, although they ariſe in the ſame manner, and obſerve the ſame courſe with thoſe in men, as far as the Holy-bone; yet they fall not out of the *Peritoneum*, nor reach unto the ſhare-bones, but before they come to the Teſticles, are cleft into two unequall branches; the leſſer of which is ſcattered into the ſides of the Womb, toward the bottom of it; the greater being joined to the ſpermaticall Artery, and inoculated with it, enters into the Teſticle of its own ſide. Laſt of all the fourth pair is called [X] *Lumbares*, the Loin-veins [4 4 4] two, or three, which the Hollow-vein ſends forth from its backſide, which looks towards the bodies of the Rack-bones of the Loins; and therefore they are not to be ſeen, unleſſe the Trunk of the Hollow-vein be lifted up. Theſe veins go in through the holes of the Rack-bones, through which the Nerves go out, and ſo carry nouriſhment to the Spinall marrow. From them two other veins, tyed on both ſides to the ſide of the Marrow, aſcend toward the brain, with which afterward two veins deſcending from the internall Jugular, are joined by an *Anaſtomoſis* or Inoculation. *Lumbares.*

Theſe propagations being thus ſent out, when the Hollow-vein has almoſt attained to the *Sacrum*, or Holy-bone, about the fifth Rack-bone of the Loins, it inclines under the great Artery, and is cut into two notable branches called *Iliaci* [XX] which having gone a little way are again cleft into two others [Y and Z] of unequall bigneſſe, of which one is called the inner, the other the outer. The inner is leſſe, the outer larger and greater. But before they be ſo divided, they ſcatter two other propagations, the firſt of which [5] is commonly called *Muſcula ſuperior*, the upper Muſcle-vein, which is diſſeminated overthwart, through the Muſcles of the Loins, and *Abdomen*, or paunch, from whence I would call it *Muſcula lumbalis*, the Muſcle-vein of the Loins: the other [6] is named *Sacra*, or the Holy-vein, becauſe it reaches ſome little twigs to the upper holes of the Holy-bone, for the nouriſhing of the ſaid bone and the Spinall-Marrow. The diviſion of the Trunk into the two Iliacall branches. *Muſcula ſuperior.* *Sacra.*

But from both the Iliacall branches many veins iſſue, before they go out of the *Peritoneum* or Rim of the Belly toward the Legs; and from the inner branch two. The firſt [7] ariſes from the outſide called *Muſcula media*, the middle Muſcle-vein; becauſe it is ſcattered into all the Muſcles of the Buttocks, and into their ſkin: For it carries aliment to all thoſe Muſcles, which are of the outſide, or Back of the bone *Ilium* or Hanch-bone, as alſo to the very joint of the Hip, that for this cauſe it ought to be eſpecially taken notice of by them, who would ſomewhat curiouſly conſider the cauſe of the ach in the Hip, or the *Sciatica*. I ſhould think that this vein may not be amiſſe called *Glutea* from its inſertion, becauſe it is implanted into the Muſcles called *Glutæi*, or Muſcles of the Buttocks. The other [8] grows out of the inſide, and is a notable vein, called *Hypogaſtrica*, or the vein of the water-courſe, from its diſtribution into almoſt all the parts of the *Hypogaſtrium*, or water-courſe. From this iſſues a branch named *Hæmorrhoidalis externa*, the outer Emroid-vein, becauſe if at any time it ſwels with a more fæculent bloud, or hot, or ſalt, it makes the outward Emroids of the Fundament. This affords twigs to the holes of the *Os ſacrum*, or Holy-bone, but beſtows greater branches upon the Muſcles of the *Rectum Inteſtinum*, or the Strait-Gut, as far as to the outer skin of the Fundament. There is alſo another branch ariſing from the ſame Hypogaſtrick-vein, which we call *Cyſticus*, the Bladder-branch, and is worthy of obſervation both in men, and women; in men, becauſe it is ſpent upon the Bladder; but in women, becauſe in them being ſuſtained with a fat membrane, it goes with ſome twigs to the Bladder; but with more to the bottom of the Womb; and with more manifeſt ones to the Neck of it, by which veins alone ſome think that the monthly courſes flow in Virgins, and ſome alſo think the ſame in women. But the monthly courſes do not only flow out by theſe branches, but by thoſe alſo, which we told you were ſent from the ſpermaticall branch, and which go to the bottom of the Womb, not to the Neck. For the menſtruous bloud is uſually purged out, whether in virgins, or women, every month; not only through the Neck, but eſpecially through thoſe paſſages of the Womb, called *Cotyledones*. Which we have ſhown here at *Padua*, publiquely in the Theater, the firſt year of our being Profeſſor, in the carkaſſe of a certain woman having her monthly courſes. For we ſaw that the Hypogaſtrick branches, and the ſpermatick veſſels with the Teſticles were filled with bloud, and that the Womb itſelf did pour out a thicker bloud, the little mouths of the veins in the inner part of the Womb lying open, and manifeſtly gaping. Yet I ſaw twice in others, that the menſtruous bloud came out of the veins of the Neck only, not alſo out of the Womb, and in another on the contrary that it flowed out of the Womb only. But the ordinary way is for women to be purged at them both, and not at one only, except when beſides the intent of nature obſtructions do ſeem to hinder their flowing. Propagations of the inner Iliacall branch. *Glutea.* *Hypogaſtrica.* *Hæmorrhoidalis externa.* *Cyſticus.*

Both

But we have observed, and seen divers times, whilest we were about the cure of Ulcers in the privie Members, and Neck of the Womb, that at what time the monthly courses do flow, the mouth of the Womb gapes. I saw also then, that those parts were dilated with a certain stinking moisture, and that the Neck of the Womb appeared much larger, then it was wont to be at other times. And therefore no man need to wonder at that, which hath been observed by some Writers of our age, that in the time of their courses these parts have been so widened in some, that being new married, although they were true Virgins, they have for this reason been accused, and thought to have been defloured. Wherefore if it happen, that any, who are new married, doubt of their Wifes virginity, because they find the privy passage very wide, it will behove them to consider, whether their flowres were not at that time upon them. Now at length the remainder of the inner Iliacall Trunk makes to the Share bone, and taking to it a propagation of the outer Iliacall, together with which it makes one vein, and so passing through the *Peritoneum*, and hole of the Share-bone, it spreads itself into the Leg, and is extended almost beyond the middle of the Thigh on the inside.

Propagations of the outer Iliacall branch. *Epigastrica.*

From the outer branch in like manner some veins issue: and first of all, that which is called *Epigastrica*, or vein of the lower Belly [9] which arises from the higher part of the branch, and is so named, because it goes to the Muscles of the *Epigastrium*, to wit, the right Muscles of the *Abdomen*. For passing with its chief branch out of the *Peritoneum* or Rim of the Belly, it climbs straight up of both sides under the right Muscle, till it come near to the Navill, where it is joined by *Anastomosis* with the descending Mammary-veins. But this *Anastomosis* or Inoculation is seldom found in men, but in women it is very conspicuous, from whence also *Galen Lib. de Dissect. ven. & Arter. Cap.* 8. witnesses, that that great sympathy betwixt the Womb and the Breasts or Dugs is caused by these two vessels. But the most learned *Hippocrates* has explained this sympathy in many Aphorisms of the fifth Section. For in the fiftieth Aphorism he sayes, If you would stop the courses in a woman, apply a very great Cupping-glasse to her Breasts. And in the thirty seventh. If the Breasts of a great bellied woman, do of a sodain become small, the child proves Abortive. And in the thirty eight; If one of the Breasts of a great bellyed woman become small, one of the Twins, that she goes with, proves Abortive; and that a Male, if the right Breast be small; a Female, if the left: so the Womb being diseased, the Nipples become pale; and upon a Dropsie in the Womb they swell up. But there is a sympathy also not only by reason of the veins, but also of the Nerves, that come from the sixth Conjugation. Whence we see, that if the Breasts of a Woman, or Virgin be handled, they are provoked to lust; so that for this reason also those women, that have great Breasts may be accounted more lustfull, as *Afra* is in *Martiall*. But it is convenient to note concerning the originall of this vein, that very often it arises out of the Crurall branch, which we shall by and by describe, but oftner out of the Iliacall. Another vein is the *Pudenda* [11] which arises from the inside of the outer Iliacall branch, after it is come out of the *Peritoneum*, or Rim of the Belly, and it is called *Pudenda*, because it is spent upon the privities of both Sexes. For in men it is distributed into the *Scrotum* or Cod, and into the skin of the Yard; but in women it is propagated to the Lips and skin of the privy passage, to the *Nympha* or wings, and other parts of it; but in both men and women to the Glandules, that lye about the leskes, whence arises that confluxe of matter into these Glandules, in a pestilent or venereous *Bubo*. Lastly, the *Musculs inferior*, or lower Muscle-vein [12] is that, which goes to the joint of the Hip, and is disseminated into the skin, and Muscles thereabout, by reason whereof in my judgment by a stricter Appellation it might be better called *Coxendica*, or *Coxalis*, the Hip-vein.

Pudenda.

Musculs inferior,

CHAP. V.

Reckons up the propagations, and branches of the outer Iliacall branch disseminated through the crus, or great Foot, that reaches from the lower part of the Buttocks to the ends of the Toes.

THe outer branch then of the Iliacall veins [Z] when it hath sent forth the said propagations, falls out of the Rim of the belly, and is carried to the *Inguina* or leskes, through the upper and inner region of the Hip-bone, through which the first and second bending Muscles of the Thigh do descend, and makes the Crurall vein [Y]. The History whereof that we may deliver in an easie method, we will divide it into Trunk, and Branches. But before the Trunk be cleft into its branches, it shoots out four propagations; the first of which is that they call *Saphena*, [13] and vein of the inner Ankle, because it runs near thereunto; it is also commonly called by Physitians *vena tali*, but improperly, as we have said above in our first Book. But it arises from the inner side of the Trunk, presently after its departure out of the *Peritoneum*, or rim of the Belly, and having no Artery for its companion, runs straight downwards under the skin

The division of the Crural vein into a Trunk and branches.

Four propagations of the Trunk before its division.

Saphena.

skin, through the insides of the Thigh, & Leg; and when it is now come to the inner Ankle, it spreads itself into the upper part of the Foot, and scatters a branch overthwart, from which afterward many others arise, that are distributed in their order to every one of the Toes. This vein scatters other propagations by the way, but which are seldom found answerable one to another, either in number, or bigness; as we have already more then once intimated, that nature is found to sport in the veins, but especially in those of the joints. *Four propagations of the vein Saphena.*

The first [17] of these propagations, not far from the originall of the vein itself, is delt into the upper skin of the inner Region of the Thigh, in two branches; of which the outer, which is the thicker, creeps through the fore, and outside of the Thigh, under the skin; but the inner goes more inwardly, and spreads itself into the rim of the Belly. The second [18] is propagated, when the vein has now attained to the middle of the Thigh. The third propagation [19] arises about the Knee, and brings forth two off-springs, one, which is disseminated into the skin of the forepart of the Knee, by the *Patella* or Whirl-bone, but the other into the skin of the Backside, where the bending, or Ham is, about which it is rowled orbicularly. The fourth [20] is carried to the middle of the *Tibia* or Leg, with surcles forward, and backward. Over against the *Saphena*, another vein [14] is brought forth from the outside of the Trunk, but shorter then the vein *Saphena* is, and reaches outward, and overthwart into the skin, that covers the forepart of the Hip-bone, as also into the Muscles of the same place, which the later Anatomists call *Ischia*. These propagations being brought forth, the Trunk afterwards is drencht into the Muscles, that compasse the bone of the Thigh, and sets out a third propagation [15] which they call *Muscula* the Muscle-vein; and there use to be two of them. For the outer, which is the lesse, sends shoots to the second, and fourth, extending Muscles of the *Tibia* or Leg, together with the skin; the inner, and greater, affords twigs to the third extender of the Leg, and to almost all the Muscles about the Thigh. After this the Trunk turning to the Backside, and descending by degrees, scatters some other twigs into the membranes of the Muscles, and by and by sends out a fourth vein, which runs into the backside of the Thigh, and is called *Poplitea*, the Ham-vein [16] much spoken of by writers of Physick, but especially by *Hippocrates* the chief of them, who 6. *Epidem.* 1. 5. commends much the opening of it in diseases in the Kidneys. But it is oftentimes seated too deep to be cut without very great difficulty. I have learnt by frequent experience, that issues made in the *Sura* or calf of the Leg, to which this vein spreads itself, have done a great deal of good in many diseases. This vein, when it is propagated, sometimes receives the addition of a Sprig from the inner branch of the Muscle-vein; oftentimes also two propagations issue from the Trunk, one higher, and another lower, which afterward are united in their journey. But presently after its rise it scatters some branches into the skin of the Thigh, about the higher and hinder part of it; then it runs down directly through the middle of the Ham, or bending of the Leg, into the Calf, to which it distributes many Surcles, that run on with an uncertain course, some directly, some overthwart, and some obliquely. These little branches being thus disseminated, the vein passes on as far as to the *Talus*, or Cockall-bone, and there at length determins. *Ischia.* *Muscula.* *Poplitea.*

And this is the progresse of the Crurall-Trunk, and these the propagations which it scatters, before it be divided. For lying upon the bone of the Thigh, it so descends, and runs side-long near to it, that, when it has attained to the Knee, it is carried betwixt the two lowest, and hindmost heads of the Thigh, in which place [Δ] it is cleft asunder into two branches, an outer, and an inner one. But they are of unequall bigness, the outer being the smaller, and the inner the greater, but both of them [Θ Λ] are scattered through the Leg, and lowest part of the Foot. The inner [Θ] in its descent sends some propagations to the Muscles, that are placed on the backside of the Leg, and especially those which make the Calf, but most of all to the inner part [21] of the *Gasteronemius externus*, or outward Calf-Muscle, and so afterward continuing its course downward, when it is come to the lower *Appendix* of the *Tibia* or Leg, and has bestowed some shoots upon the skin, it is reflected under the inner Ankle [22] and runs out as far as to the great Toe. The outer [Λ] is presently cleft into two lesser branches, that are likewise unequall, of which the inner [Ξ] that is the greater, and lies deep, is wholly spent upon the Muscles of the Calf, running all along directly betwixt the two heads of the *Gasteronemius externus*, or first moving Muscle of the Foot, as also betwixt the *Gasteronemius internus*, or inward Calf-Muscle, and the *Tibieus anticus* or forward Leg-Muscle, and at last betwixt the Muscles, that bend the Toes, distributing some surcles every where by the way to the Muscles, through which it passes. When it comes to the mid length of the Leg, it is again subdivided into an inner, and an outer branch. The inner of these distributes a twig near to the joint of the *Tibia* or greater Leg-bone, and the bone called the Cockall, descends with the Tendons of the Muscles, and is divided into the great, the fore, and the middle Toes. The outer passes on near to the *Fibula*, or lesser bone of the Leg, and when it comes to the Ligament, which tyes together the greater and lesser bones of the Leg, it shoots forth a branch, which perforating the Ligament runs into the Foot, and is scattered into the Muscles; which bend the Toes of the Foot outward. *The division of the Trunk into two branches.*

But

But the outer and leſſe branch [Π] of the Crurall-vein goes from that diviſion of the outer branch, which is made near the Ham, to the upper *Appendix* of the *Fibula*, as alſo to the outer, and hinder part of the *Tibia*, where ſcattering many little branches, it goes to the outer Ankle, and at laſt ends in the Foot.

And this is the univerſall Hiſtory of the Hollow and Gate-veins, wherein we have perfected the whole courſe of their diſtributions. It ſeems yet to remain, that we ſpeak of the Umbilicall, and Arterious veins. But becauſe the Umbilicall vein is nothing elſe but a more notable propagation iſſuing out of the Gate-vein; and in a man grown performs the office of a Ligament, rather then a vein; becauſe it keeps the Liver in its place; as the ſtories of them do witneſſe, who upon the cutting off, or wounding of the Navill, have ſodainly dyed, their reſpiration being hindred by the weight of the Liver falling out of its place, and putting down the *Diaphragma* or Midriffe with it; we thought it not worth our pains to make any more mention of it in this place. But if any one will obſtinately contend that it is a peculiar vein with arguments fetcht out of his own Brain, we know no better counſell, that we can give him, then to conſult better with his own ſenſe, or if he will contend further, to purge his Head with Hellebore, that that dimneſſe of his Eye-ſight may be a little taken away. But we ſhall with more convenience make mention of the *Vena Arterioſa*, or Arteriall-vein, in the following Book, when we ſhall explain the Hiſtory of the *Arteria venoſa*, or venall Artery, becauſe they are very like one another, and therefore the ſame pains may ſerve them both.

An Explanation of the Table of the Veins.

This Table delineates the Hollow-vein, entire, and free from all parts. Wherein we have marked the Trunks, and larger branches, with pretty great letters: but the propagations with little ones; and when they are at an end, with figures.

AD. THe Ascendent Trunk *of the Hollow vein, the beginning whereof is about* A, *which notes the place, wherein the Liver should stand in the proportion of this figure, the end about* D. *For it passes on undivided from the convex part of the Liver, about which it scatters little branches,* a a a. *as far as to the Hollow of the Neck; but it scatters some propagations, three in number.* The first of these, æ æ, *is called* vena Phrenica *the vein of the Midriffe, which is distributed of both sides into the midrieffe and* Pericardium, *or purse of the Heart growing thereto, as also into the* Mediastinum *or partition of the Chest.*

Another *is* Vena Coronaria *the Crown-vein,* bb, *which embraces the* basis *of the heart in manner of a Crown, dispersing many Surcles to the point of it.* The third *is the vein* Azygos, *or without a mate,* cc, *which issuing out from the right side of the Hollow-vein, about the heart, about the fifth Rack-bone of the Chest, goes down near to the right side of the Rack-bones, as far as to the second almost of the loines. There are ten propagations* ddd *from this, sent to as many bony distences of the ribs, which are called* Intercostales inferiores, *the lower veins betwixt the ribs.*

B. *Shews how the Trunk* A D *is bowed toward the right side, because of the situation of the heart.*

C. *The orifice of the Hollow-vein reaching into the right ventricle of the heart.*

D. *The division of the Ascendent Trunk about the Hollow of the Neck,* EE. *into two branches* EE. *which they call* subclaviæ, *or the veins under the Collar-bones. From these arise many propagations, some issuing from the lower, others from the upper part of them.*

Out of the lower part *issue five.* The first *is called* Intercostalis superior *the upper vein beeween the ribs,* c, *and scatters two Surcles* f f, *to the distances of the three upper ribs.* The second *is* mammaria *the vein of the dugs,* g, *which, descending under the breast-bone, as far as to the strait Muscles of the* Abdomen, *is inoculated* 10, *with the Epigastrick-vein climbing upward,* 9, *giving surcles to the Gristly distances of the true ribs, as also to the* Mediastinum, *and Muscles, that lie upon the breast.* The third *called* Mediastina, h, *is disseminated into the* Mediastinum, *or partition of the Chest.* The fourth, vertebralis, *or the vein of the Rack-bones,* i. *climbs up through the holes, that are bored in the transverse processes of the Rack-bones of the Neck, distributing sprigs to the Muscles, that lie upon the Rack-bones.* The fifth *is called* Cervicalis *or the vein of the hinder part of the Neck,* l, *distributed into the Muscles, seated on the lower part of the back side of the neck, and on the upper part of the Chest.* Out of the upper part *issue three.* The first *is* Jugularis interna, *the inner vein of the Hollow of the Neck,* m, *which having sent ever small sprigs from its outer branch to the Chops, and region of the Ear, is joined by the inner all the way to the* Arteria carotis, *or sleepy Artery, and is divided near to the skull into two branches called* Encephalici *or of the Brain, by* Spigelius; *of which the* n. hindmost and greater, n, *having entred into the skull through the second hole of the Nowl bone, is inserted* o o, *into the first* 1, *and second* 2 *sinus of the thick membrane. But* the foremost and lesser, p, *having entred through the seventh hole of the wedg-bone, is scattered through the sides of the thick membrane.* The second *is the outer Jugular vein,* q, *which getting up by the sides of the Neck, is divided near to the Ears,* r, *into two branches; of which* the one *called* Profundus, f, *is variously dissominated into the Muscles of the* Larinx *or Throttle, and the bone called hyoides, as also into the Tongue, the Palat, and hollowesse of the Nostrils, and lastly into the skull with three propagations, of which that which passes* t *out of the forepart of the eye, through the second hole of the wedg-bone, is very well delineated here.* The other *called* Subcutaneus, u, *first of all spreads its fore-branch* x, *into the Muscles and skin of the Face, which joins with its fellow about the top of the nose, and makes the Forehead vein* y; *then it issues out another hinder branch, which partly, creeps upward along the temples,* z, *and partly is carryed behind the ears to the skin of the back part of the head.*

α. β. α The third, Cervicalis Superior, *the upper vein of the Neck,* β *is propagated into the Muscles behind on the back side of the Neck. There are three* sinus *or small channels of the thick membrane of the brain, the first or right one is marked with* 1, *the second or left one with* 2, *the third with* 3. *The hinder part of this, which is nearer to the Nowl of the Head, is shadowed; but the forepart, which is next the Forehead, is seen manifestly. From this sinus many little veins, which they call* Ductus, *are reacht forth to both sides.*

F. *Here the subclavian vein takes on it the name of* Axillaris *or the vein of the Armpit, and is divided into two branches, the Cephalick* G, *and the Basilick* I. *But before this division it scatters two twigs:* the first *called* scapularis interna, *or the inner vein of the shoulder blade,* γ, *the other* Scapularis externa, *the outer blade vein* δ. *The Basilick vein also,* I, *before it enters the Arm, propagates two;* one *called* Thoracica superior, *the upper Chest-vein,* ε. *which is distributed through the inside of the Pictorall Muscle, and in women, through the Dugs:* the other *called* Thoracica inferior, *the lower Chest-vein,* ζ, *which descending along the side of the Chest, goes to the Muscle called* Anisalptor.

G. The Cephalick vein, *which, before its division, sends away a sprig,* η, *into the Muscle* deltoides, *and another* θ *into the Muscles of the Cubit.*

When the Cephalick vein comes to the joint of the Cubit, at the outer bunching forth of the Arm it is cut into three branches, H. *The first,* ι, *or deep and middle one goes to the Muscles arising from the said protuberation.* The second κ, *or inner goes to the making of the vein called* Mediana λ. The third μ, *or outer is carried obliquely,* ν, *by the* radius *or lesser bone of the Cubit, to the out side of the Arm, and so creeping on obliquely all the way, when it is come to the root of the wrist, it is joined with a little branch of the Ba-*

filick-vein, τ, and makes the vein called Salvatella.

The Basilick-vein, which on the right hand is called Hepatica, or of the Liver, on the left Lienaris, of the Spleen. This before its division sends out a Surcle, ϑ, to the heads of the Muscles of the Cubit; and then
ϑ. another notable one π, which being carried down obliquely, bestows its Surcles upon the Muscles, that arise
π. from the outer protuberation of the Arm.

K. The division of the Basilick-vein K into two branches, the one called Profundus or the deep one, the other Subcutaneus, or branch under the skin. The deep one
L. L, when it comes to the bending of the cubit, is divided into two, M, one of which called Radius N, at the Radi-
M. us, or lesser bone of the Cubit; the other called cubiteus,
N. O, at the greater bone of the Cubit, goes to the hand.
O.

P. Subcutaneus, or the branch next under the skin P, near to the inner protuberation of the Arm is divided, Q,
Q. into two other, of which the inner R together with
R. the inner branch of the Cephalick κ, makes up the vein mediana λ, which is likewise divided into two branches, the outer of which, ϱ, is called by some Cephalica
ϱ. manus, and goes to the Thumb; the inner σ to the
σ. fore and middle fingers: The outer S going to the
S. wrist, is joined toward the little finger with the outer branch of the Cephalick-vein about τ.
τ.

†. The little valves, which are found in the veins of the joints, are handsomely cut out here, as it were to be seen through.

The Descendent Trunk of the Hollow-vein which
T. begins about the region of the Liver T, and ends
V. about the fifth Rack-bone of the loins V. There are four Twigs growing from this. The first υ called A-
υ. diposa or Fattie-vein, distributed to the Membrane of
φ. the Kidneys. The second φ the Emulgent going to the Kidney. The third, præparans vas, the preparing
χ. vessell; the right one χ arising out of the Trunk T.V.
ψ. the left ψ out of the left Emulgent, both afterward going
ω. into the Testicles ω. The fourth is the three Lum-
444. bares or loin-veins 444.

The division of the Descendent Trunk V, into the
XX. two Iliacall branches XX, both which are again divi-
Y. ded into two other, an inner one Y, and an outer Z. But
Z. before this division two propagations are issued forth,
5. Muscula lumbalis, or the Muscle-vein of the loins 5,
6. and Sacra or the holy-vein 6.

Y. The inner Iliacall vein, before it goes out of the Peritoneum, or rim of the belly, shoots out two propa-
7. gations, the first called Glutæa 7, and the second Hy-
8. pogastrica 8. The remainder of it passing through the Peritoneum, is spent upon the inside of the Thigh.

Z. The outer Iliacall vein likewise before its going forth of the Peritoneum scatters three propagations;
9. the first called Epigastrica 9, going into the Muscles of the Epigastrium, and the strait ones of the Abdo-
10. men, where they are joined by Anastomosis, or inocu-
11. lation 10. The second called Pudenda, 11, spent
12. upon the privy parts. The third Coxalis, 12, upon the Muscles of the Hip.

Here the outer Iliacall vein having past through the Peritoneum or rim of the Belly enters the Crus, and
Γ. begins to be called the Crurall Trunk Γ, that is undivided as far as to the two lower heads of the Thigh. But it reaches forth four propagations before its division.
13. The first; 13, is called Saphena, which creeps through the inside of the Leg, under the skin as far as to the ends
14. of the Toes. Another 14 called Ischia is spread out
15. into the skin upon the Hip-bone. The third 15 named Muscula is sent to the Muscles, which extend the
16. Leg. The fourth 16 named Poplitea is distributed into the Calf of the Leg.

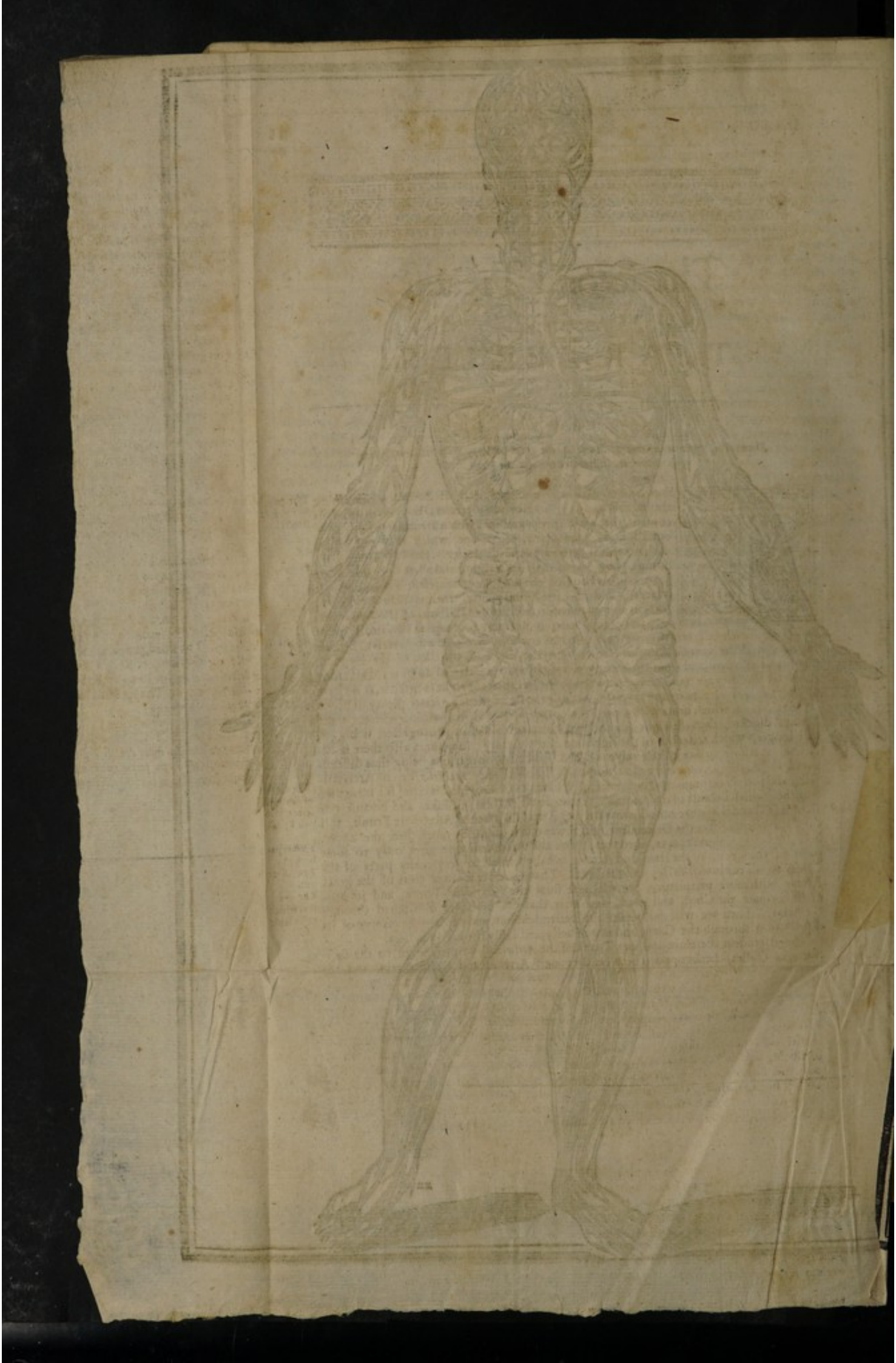
13. The vein Saphena also scatters from itself four
17. surcles, the first 17 into the upper part of the skin of
18. the inside of the Thigh: the second 18 about the
19. middle of the Thigh: the third 19 into the Knee:
20. the fourth 20 is carried forward and backward to the middle of the Leg.

Δ. The division of the Crurall Trunk near to the two
Θ. lower heads of the Thigh into an inner branch Θ, and an
Λ. outer one Λ.
Θ.

21. The inner distributes little branches to the Muscles of the Calf 21, and then runs down under the inner ankle
22. to the great Toe 22.

Λ. The outer presently is cleft into two branches, an in-
Ξ. ner one Ξ, and an outer Π. That is spent wholly upon the
Π. Muscles of the Calf: this passes on near to the Fibula or lesser bone of the Leg, through the outer and back-side of the Leg.

THE



The second Treatise, Concerning The ARTERIES.

CHAP. I.

Shews the upper or ascendent Trunk of the great Artery, with its propagations that are distributed through the Head.

THere is no controversie among writers of Anatomy concerning the number and originall of the Arteries, but an unanimous consent, that all the propagations, which are scattered throughout the body, take their rise from one, which they call *Aorta*, and that this is derived out of the Heart. But the Heart consisting of two *sinus* or cavities, a right, and a left one; this great Artery grows out of the left *sinus* or ventricle [A], where it is largest, and more hard, and gristly, then elsewhere. But as soon as it is grown out, and before it fall out of the *Pericardium* or purse of the Heart, it presently propagates two small sprigs [a a] one of each side, which they call *Arteriæ Coronariæ*, the Crown-Arteries, because together with the *vena Coronalis*, or Crown-vein, they compasse the *basis* of the Heart in manner of a Crown, and from these many propagations are scattered downward all along the Heart. But they are more, and greater about the left, then the right ventricle, as we have also formerly said concerning the vein, because the Heart needs a greater plenty of bloud on that side, as which beats with a perpetuall, and more violent motion, wherein more bloud is digested, then the right *sinus* or ventricle does: yet that propagation is bigger, and longer, which arises out of the right side of the Artery: sometimes also there is only one, at whose orifice a little valve is found. These propagations being thus dissetminated, the Artery ascends somewhat, under the Trunk of the *vena Arteriosa*, or Arteriall-vein, and pierces through the *Pericardium*, and, having got above it, is cleft [B] into two branches, which because of their notable greatnesse we will call Trunks, and because one ascends [C] and the other runs downward [Q] that shall be the Ascendent Trunk, this the Descendent. Yet the Descendent, and lower one is bigger by much then the upper, because that serves more parts, then this. For the Ascendent one goes only to some parts of the Chest, to the Head, and Arms; but the lower to very many parts of the Chest, to all the lowest Belly, and the Legs. That therefore we may treat of the great Artery with more perspicuity, we will first shew the Ascendent Trunk, and its progresse through the Chest, and Head, and after that its branches distributed through the Arms. Then we will fall upon the Descendent one, and explain the manner of its distribution through the Chest, and lowest belly, and lastly through the Legs.

The Ascendent therefore or upper Trunk of the *Aorta* [G], being fastened to the *Oesophagus*, or Gullet, climbs upward betwixt the rough Artery, and Hollow-vein, and the *mediastinum*, or partition of the Chest. Which situation of it they ought diligently to observe, who desire to know the reason of that Aphorism, which is the four and twentieth of the fifth Section in *Hippocrates*: For, sayes he, cold things, as snow, and ice, are enemies to the Breast, provoke coughs, and cause eruptions of bloud, and distillations. Truly they are enemies to the Breast, because, whileſt they are swallowed down through the Gullet, they cool the rough Artery, that lies next to it, together with the Gullet, which part being of it self cold does easily take harm from so violent a cold: hence the cough, and other diseases of the Breast follow one another in a long row. But issues of bloud happen in like manner, the great Artery being cooled, whereby the vitall Spirits, and the bloud are driven back to the Heart, and from thence are sent up forcibly to the Head, which being flust, eruptions of bloud are caused by its dropping forth at the Nostrils, as also

The originall of the great Artery.

Arteriæ Coronariæ the Crown-Arteries.

The divisions of the great *Artery* into two Trunks.

VVhat parts both the Trunks nourish.

The order of that which is to be said.

alſo catarrhs and diſtillations, it being driven down undigeſted to the inferiour parts. And hence alſo a reaſon may be rendred, why ſome, upon drinking of cold water after vehement motions, and exerciſe of the body, have preſently been ſuffocated, the paſſion of the heart, and grievous ſwoundings following thereupon. For the Artery being vehemently cool'd, the blood is congealed, as well that, which was in the *Aorta*, or Great artery, as that which abides in the heart; from whence happen at firſt fearfull ſymptoms, and then ſuddain death. But we have ſeen in theſe men, that a vein being opened, the bloud hath come out thick, and cold, and with very great difficulty, whence alſo we have not found a more preſent remedy for them, then ſuch things, as by reaſon of the thinneſs of their parts have a power of diſſolving the clots of blood. Hence alſo a reaſon may be given, why in burning feavers the tongue becomes black, and the diſeaſed can hardly ſwallow. For although it be true (which is the cauſe commonly aſſign'd) that many vapors are ſent up from the whole body to the head; yet we may aſcribe a main cauſe of this blackneſſe to the nearneſſe of the artery, which being ſet on fire, and inflamed, procures much miſchief to the gullet, and conſequently to the tongue it ſelf.

The diviſion of the Aſcendent trunk into two branches.

The ſubclavian arteries.

But the Aſcendent Trunk, whilſt it paſſes thus upwards, is divided into the two ſubclavian arteries, [DD] of which one runs to the right ſide, and the other to the left. They are called *ſubclaviæ*, as long as they are in the cheſt, for the ſame reaſon as the ſubclavian veins are ſo called, becauſe they run under the *clavicule* or collar-bones: but as ſoon as ever they are faln out of the cheſt, they change their name, and are called *Axillares* [E]. From both the ſubclavian arteries, when they have attained to the firſt rib (for before that they ſend forth no propagations) many ſprigs iſſue out, as well from their upper, as lower part. From the lower iſſues the upper Intercoſtall artery, or *Intercoſtalis ſuperior* [b], which being faſtned to the roots of the ribs, beſtowes particular branches upon the diſtances of the four uppermoſt which run under the ribs, together with the veins, as far as to the griſtles, from which propagations are diſperſed into the marrow of the back, and the neighbouring muſcles. From the upper part iſſues firſt that which is commonly called *Cervicalis*, or the artery of the neck [c], but better *vertebralis*, of the rack-bones, which ariſes more backward, and toward the bodies of the rack-bones, and aſcending obliquely, near to the ſeventh rack-bone of the neck, like the neck-vein, paſſes through the holes of the tranſverſe proceſſes, and upper rack-bones of the neck, where it ſhoots out many propagations, which enter the ſpinall marrow through the common holes, at which the nerves go out. It ſends alſo a pretty company to the muſcles that are ſeated on the back ſide of the neck, and aſcends to the nowle-bone together with the vein, through whoſe firſt notable hole, by which the ſpinall marrow deſcends out of the head, it enters the skull. After this it is joined with its fellow of the other ſide under the ſpinall marrow, which remains yet in the skull, and ſo runs ſtraight forwards, under the middle of the *baſis* of the brain; but when it hath now attain'd to the *ſellæ*, or ſaddle of the wedg-bone, upon which the phlegmatick glandule lies, it is divided into two branches, a right, and a left one, both which at the ſide of the ſaddle creep to the ſecond pair of the nerves, where being broken on both ſides into an infinite number of ſurcles, they are diſperſed betwixt the firſt and ſecond pair of the nerves, and folded together with the thin membrane make that complication of veſſels call'd *plexus Choroides*. The next is *arteria mammaria* or artery of the paps [d] which being reflected under the breſt-bone (accompanied with the mammary vein) deſcends along its ſides, and when it comes to the griſtle called *Enſi-formis*, or the breaſt-blade, about the ſides thereof goes out of the cheſt, and running under the right muſcles of the *abdomen*, deſcends directly through the lower ſide of them, and at length neer the navell, is joined by *anaſtomoſis* or inoculation [x] with the Epigaſtrick artery plying upward [i]. But before it leaves the cheſt, it ſcatters particular branches to the ſix diſtances betwixt the griſtles of the ſeven true ribs, which branches determin together with the griſtles. A third [e] is otherwiſe called *Muſcula* the muſcle artery, but might bee better, and more ſtrictly named *Cervicalis*, being it is diſſeminated into the muſcles, that are placed in the region of the neck, as far as to the *occipitium* or nowl of the head.

Intercoſtalis ſuperior, the upper artery between the ribs.

Vertebralis, the artery of the rack-bones.

Mammaria, the artery of the paps.

Cervicalis, the artery of the neck.

Arteria axillaris.

Its branches before it enters into the arm.

From its lower part.

From its upper part one.

Theſe branches being ſent out, the ſubclavian artery goes out of the cavity of the cheſt, and getting above the firſt ribs tends obliquely to the arm-pit, and ſo makes the axillary artery [E] which afterward is ſpread into the arm. But before that it ſcatters ſome propagations, and *from its lower part* three, of which the firſt is *ſcapularis interna*, the inner-blade artery [f] which goes to the muſcles on the hollow ſide of the ſhoulder-blade. Another is *Thoracica ſuperior* the upper cheſt artery [g], which goes to the pectorall muſcle, that leads the ſhoulder forward to the breaſt, and the other muſcles that lie upon the breaſt, and is a pretty big one. The third is *Thoracica inferior* the lower artery of the cheſt, [h] which is alſo a large one, and running down all along the ſide of the cheſt, is the greateſt part of it ſcattered into the broad muſcle called *Latiſſimus*, which moves the ſhoulder backward from the breaſt. *From the upper part* of the axillary artery ariſes one called *ſcapularis externa* the outer blade-artery [i], which climbing up to the top of the ſhoulder is diſſeminated into the muſcles that cover the gibbous ſide of the ſhoulder-blade,

blade. The remaining part of the axillary artery passes on in company of the Basilick vein to the arm, upon all which it is afterward spent, of whose distribution we will speak in the following Chapter.

That which remains yet of the Ascendent Trunk [L] being sustained with the *Thymus* neer to the upper part of the breast-bone, is divided into two branches [MM] which they call *Carotides*, or *soporales* the sleepy arteries, because they being obstructed, or any way stopt, we presently fall asleep, of which *Valuerda* witnesses in *Anatom. lib. 6. c. 11.* that *Realdus Columbus* made tryall in a young man, among a great company of men. They are unequall in bigness, the right one being much thicker then the left, but they tend directly upward, being carried along by the sides of the neck, and fastned to the rough artery, and to the internall jugular veins, by the benefit of a membrane, and when they are come to the cups, are divided into two branches [N] of which one is the outer, the other the inner one: that is the lesse, this is the greater. *The outer* [O] sends propagations [+] to the cheeks and muscles of the face; then when it is come to the ear, it is divided in twain; for *one branch* [r] of it goes to the backside of the ear, from which two branches under the ear enter the neather jaw through the first hole of it, that is seated at its processes, and throughout the length thereof are disseminated into the roots of all the lower teeth; that which remains, going out at the second hole; which is placed at the chin, is scattered into the lip. The *other branch* [q] creeps through the Temples and fore-head, and is spent upon the muscles of the face. The *inner branch* [P] of the sleepy artery, or *arteria Encephalica* the brain-artery, is carried into the chops; and having scattered some propagations to the tongue and throttle, is divided about the *basis* of the skull, into two unequall branches, to wit, a greater, and a lesser one. The *lesser and himmost* [s] is carried together with the greater Encephalick branch of the internall jugular vein to the back-side of the skull, enters through the second hole of the *occipitum* or nowl-bone, and goes into the *sinus* or canale of the thick membrane. The *greater and more forward* [t] having entred the cavity of the skull through a hole made on purpose for it in the temple-bone, and attain'd to the saddle of the wedg-bone, going every where under the hard membrane; first of all propagates a branch on both sides into the side of the thick membrane, then in beasts scattering an infinite number of surcles makes the *Rete mirabile* or wonderfull net, which indeed may be found in a man too, but it is very little, and seems but a shadow in respect of that in beasts. These surcles being thus placed it pierces through the thick membrane of the brain, and having got out of it, sends another propagation out of the skull, through the second hole of the wedg-bone to the eye, and its muscles, as also to the temple muscle, that lifts up the lower jaw; and then going straight up to the side of the phlegmatick glandule, it is divided into two branches, an outer, and an inner. The inner is joined with its fellow of the other side, and being joined they are wasted into many little arteries, which are dispersed through the thin membrane, and the very substance of the brain, to the originall of the optick nerves. The outer being reflected and sustained with the thin membrane, goes into the forward ventricle of the brain; being divided into many surcles, which are united with those little arteries, which arise from the *vertebralis*, or artery of the rack-bones; some with those which the vertebrall artery scatters through the *basis* of the head under the brain, but others with those which it disseminates through the thin membrane and substance of the brain, together with which they make the *plexus choroides*.

The sleepy arteries.

The division of them.

The outer, or branch of the face.

The inner, or branch of the brain.

The division thereof into a lesser and greater branch.

A subdivision of the greater.

CHAP. II.

Declares the History of the Axillary artery being distributed through the Arm.

THE Axillary artery therefore when it is come to the arm, taking the name of the Arm-trunk [FF] is carried in one undivided stock, beyond the bent of the cubit, through the inside of the arm, dispersing some small propagations on both sides to the muscles that lie on the inside of the upper part of the arm. But it goes fast by the inner or deep branch of the Basilick vein, as an unseparable companion of it, whose conduct and steps it every where follows. But presently falling down by the back-side of the upper part of the arme, where the muscles which extend the cubit stick to it, it sends forth two propagations [l & m] the lower of which is a very notable one, and so it is writhed back toward the bent of the cubit, and having attained thereunto it reaches out two surcles [n n] one of each side, so manifest, that the pulse is there oftentimes evidently enough perceived. Then going under the bent of the cubit, through the inside of it, and sinking down betwixt the two muscles that bend the second and third bones of the four fingers, it is cut [G] into two notable branches, one of which is an outer, the other an inner one. The outer [H] is carried along

Brachialis truncus, the trunk of the arm.

The division thereof into two branches.

The outer branch.

along the *Radius*, or leſſer bone of the cubit (whence I call it *Radiens*) and goes directly to the wriſt, in which place Phyſitians feel the pulſe, it being very manifeſt, by reaſon that the artery lies next under the skin. But not far from the root of the wriſt it ſhoots out a little branch [o] which runs under the tendons of the muſcles, which extend the thumb, into the outſide of the hand, and is ſpent upon the muſcles, which are placed betwixt the firſt bone of the thumb, and that of the after-wriſt, which ſupports the fore-finger. This branch being propagated, going under the inner annular ligament of the wriſt, and the broad tendon of the palm-muſcle, it is divided into three branches [ppp] like the vein, and nerve, that are its companions. The firſt of theſe goes to the inſide of the thumb, the ſecond to the inſide of the fore-finger, and the third to that of the middle. The firſt, and ſecond are each of them parted into two branches; the third is undivided. *The inner branch* of the trunk of the arm [I] runs ſtraight along the *ulna* or greater bone of the cubit (and for that reaſon I call it *Cubitens*) and is diſperſed into the palm of the hand. But it is ſo hidden among the muſcles, that it is hardly perceived to beat, unleſſe in lean folkes; and therefore Phyſitians alwaies lay their hands upon the outer branch, when they feel the pulſe in the wriſt. But it paſſes on under the tranſverſe ligament of the wriſt, and the tendon of the palm-muſcle, in company of a vein, and nerve, and ſcatters two branches into the little finger, as many into the ring-finger, and one into the outſide of the middle.

The inner branch.

CHAP. III.

Shewes the Inferiour or Deſcendent Trunk of the great artery, and the propagation thereof through the middle and loweſt bellies.

WEE have ſaid above, that the great artery [A] as ſoon as it has gotten above the *Pericardium* or purſe of the heart, is divided [B] into two branches; of which one goes upward, the other deſcends to the parts below. We have already handled the upper branch; it remains that wee explain the other alſo.

The Deſcendent trunk. Its progreſſe.

The Deſcendent trunk therefore [Q] anſwering in proportion to the ſtock of a tree, is carried down to the fifth rack-bone of the cheſt, and declining ſomewhat to the left, cleaves to that ſide of the body of the rack-bones, and ſo deſcends leiſurely. When it has now paſt the midriffe through that diviſion reſembling a ſemi-circle, which is betwixt the produ&tions of the *ſeptum tranſverſum* or midriffe, preſently it runs out by the rack-bones of the loins, leaning upon the middle of their body, til it come to the laſt of them, where near to the *os ſacrum* it is divided [R] into two notable branches [SS] which with other Anatomiſts we wil cal *Iliaei* the Iliacal arteries from their ſituation. In this journey it ſcatters many propagations from it ſelf, which are very worthy to be diligently obſerved, becauſe from thence we may eaſily give a reaſon of many accidents in diſeaſes. But they are in number eight, the Intercoſtal arteries, the two *Phreniceæ* or arteries of the midriffe, the Cœliacall one, then the upper Meſenterick, the two Emulgents, as many ſpermaticall ones, at laſt the lower Meſenterick, and the *Lumbares*, or arteries of the loins. Of theſe the Intercoſtalls are ſcattered, whilſt the trunk is yet in the cheſt; the reſt, whilſt it paſſes on through the loweſt belly. But ſome of them accompany the branches of the gate-vein, as the Cœliacall, and both the Meſentericall arteries; others thoſe of the hollow vein, as the reſt. Now we will treat of theſe in order, beginning from the Intercoſtalls, or arteries between the ribs, which are placed uppermoſt. Preſently therefore after the Deſcendent trunk [Q] is iſſued forth, from its back-ſide it ſends over little branches on both ſides to the diſtances of the eight lower ribs, which they call *Intercoſtales inferiores*, the lower arteries between the ribs [u u u] in reſpect of the upper Intercoſtall, of which we have ſpoke above. Theſe aſſociating themſelves with the veins and nerves of the ſame name, go ſtraight on by the lower ſide of the ribs; where peculiar *ſinus* or channells are cut out for them. But as the Intercoſtall veins reach in the true ribs only to the griſtles, but in the baſtard ones ſomewhat farther, to wit, to the ſides of the *abdomen*: ſo alſo the arteries end in them together with the bony part of the ribs, but in theſe run out a little farther. And theſe arteries ſend over ſome propagations through the holes of the nerves to the ſpinall marrow, and to the muſcles that lie upon the rack-bones of the back, juſt as we have ſaid the Intercoſtall veins were propagated. But the uſe of them is to diffuſe the vitall ſpirit, and the blood to the muſcles betwixt the ribs, beſides which they have alſo another notable office, to wit, of carrying down the water, and purulent matter, that is gathered together in the cheſt, into the great artery, and from thence by the Emulgent branches to the bladder. Although I am not ignorant that the moſt learned *Fallopius*, and others who have read before me in this moſt famous Univerſity of *Padua*, have ſhewn another way to their Auditors; by which either purulent matter, or water might be conveighed forth by help of the kidneys, to wit, the vein *ſine pari*, or without a companion, a little branch whereof in the left

Its propagations.

Intercoſtales inferiores, the arteries between the lower ribs.

Their uſe.

eft ſide goes into the Emulgent of the left kidney. But this way which we ſhew through the Intercoſtall arteries, is by much the ſhorter; that I paſs by this, that any matter heaped together may be more eaſily diſpatcht away through the arteries then the veins. Nor needs any one here to be afraid, leſt the vital ſpirits ſhould be infected from theſe excrementitious and ill humors, whereby the heart may incurre fearfull ſymptomes; when we willingly grant (which experience alſo hath often taught us) that whilſt the corrupt matter is empti-ed out by the urine, the ſick parties have often falo into fits of ſwounding, and other diſ-eaſes; ſometimes alſo have died ſuddenly, when the peccant humor has been of too great a quantity, or too bad a quality, and has offered ſo much violence to nature, that the heat, and ſpirits have been overcome therewith. But here a certain place in *Hippocrates* calls upon me to explain it, which has long and often troubled my mind. The place is in *Coacis prænotionibus*, where he ſayes; They, who together with the heart have their whole lungs inflamed, ſo that it falls to the ſide, are deprived of motion all over; and the parties ſo diſeaſed lie cold, ſenſeleſſe, and die the ſecond or third day. But if this happen to the lungs without the heart, they live not ſo long: Yet ſome alſo are preſerved. I have often thought with my ſelf, what ſhould be that ſympathy of the heart and lungs with the brain and nerves, that from the inflammation of thoſe parts, the Patient ſhould be ſo deprived of ſenſe and motion all over, when the ſame *Hippocrates* teacheth in the ſame place, that the diſeaſed ſuffer ſuch depri-vation in that part, & livid ſpots appear on the outſide about the rib, where-about the *Aorta* (ſo he ſeems to call the lobes or diviſions of the lungs) being inflamed fall to the ſide. But if they be not much inflamed, ſo that they fall not down to the ſide; he ſayes that there is a pain indeed all over, but no deprivation of ſenſe or motion, nor any ſpots appear. Having deliberated often with my ſelf, at length I came to be of this opinion; that there was no o-ther cauſe, but the ſympathy betwixt theſe Intercoſtal arteries, and the marrow in the back-bone. This ſympathy ariſes from thoſe propagations, which we told you paſt through the holes of the rack-bones of the cheſt into the backbone. Wherefore if the lungs, and heart be ſo mightily inflamed, that great plenty of bloud ruſh into the great artery, whereupon it ſwells, as alſo theſe veſſels betwixt the ribs, and conſequently thoſe ſurcles which go to the marrow of the back-bone; truly it cannot be, but that both the marrow, and the nerves, which iſſue out of it, be compreſt; from whence what elſe can follow, but the reſolutions of thoſe parts, into which thoſe nerves are implanted, and to which they impart the faculty of motion? This opinion ſeems to mee to bee wonderfully confirmed by a certain pretty obſervation, which the learned *Cornelius Gemma* has in his book, *de hemitritæo peſtilenti*. A certain ſtudi-ous young man, ſayes he, through the whole courſe of his diſeaſe, had his left eye leſſe then the other. He was pain'd in the left ſide, eſpecially all the time the fit raged; but about the *criſis* or change thereof, the artery of his left leg being ſwoln up was moved according to its length, that being to be ſeen by us it ſeemed to be turned upward and downward like a rope pull'd back. Who will not here willingly confeſſe, that this matter was in the arteries, when the *criſis* was made by them? But from this that hath been ſaid a reaſon may be alſo gi-ven of another obſervation of *Galen*, which is 4 *de locis affect. c.* 4. where he ſayes thus: In a cer-tain man, who was troubled with a vehement inflammation of the lungs, as well the outer, as the inner parts of his arm, from the cubit to the very ends of his fingers labour'd with difficulty of ſenſe, and their motion alſo was ſomewhat empair'd. In the ſame man alſo the nerves, which are in the firſt, and ſecond diſtances betwixt the ribs, ſuſtained harm. *And a little after*, This man was quickly reſtor'd to his health, to wit, a medicine being applyed to the place, from whence the nerves iſſue forth, near to the firſt, and ſecond ſpaces betwixt the ribs. By reaſon of the ſame branches betwixt the ribs *John Valeriola*, the ſon of that Phyſitian, whoſe obſervations we have, being yet a boy ſuffered Convulſion-fits in a grie-vous Pleuriſie.

The explana-nation of a place in *Hip-pocrates*.

The arteries called *Phrenicæ* of the midriffe, [xx] are two; one of each ſide, which ari-ſing out of the trunk, preſently after it is come forth of the hollow of the cheſt, being divided into more branches, are ſcattered into the midriffe, but eſpecially into the lower ſide of it, near to the rack-bones of the back. They ſprinkle ſome ſmall twigs alſo into the upper part, which afterwards go to the *Pericardium* or purſe of the heart, there where it growes to the midriffe.

2. *Phrenicæ* the arteries of the midriffe.

The *Cœliaca* or Stomach-Artery is but one, ſo called, becauſe it ſends over branches to the κοιλία, that is, the Stomach. This, being moſt like to the ſpleenick branch of the Gate-vein, affords many branches to the Stomach, Liver, Bladder of Gall, Kell, the gut *Duodenum*, the beginning of the *Jejunum* or empty Gut, a part of the *Colon* or Colique-Gut, the Sweet-bread, and Spleen. But it ariſes out of the foreſide of the body of the Trunk, and being ſtayed up all the way by the upper part of the lower membrane of the Kall, is divided into two notable branches, but of unequall bigneſſe, one of which goes to the right, the other to the left: that is the leſſe, this the greater. *The right branch* therefore is joined with the deſcendent Gate-vein in the *Pancreas* or Sweet-bread, that is placed under the hinder part of the Stomach, and leaning there upon the membranes of the Kall goes to the Liver; and its ſmalneſſe is worth the taking notice of, if you look upon the largeneſs of the Liver, which the Ancients long ſince, and many at this day have made the work-houſe

3. *Cœliaca.*

The two bran-ches thereof.

The right branch.

house of the bloud. But it is inserted in the hollow part, near to the Trunk of the Gate-vein, and is so small, because that part of the Liver, which entertains the roots of the Gate-vein, needed not a greater Artery; but the other part which hath the propagarions of the Hollow-vein, receives great plenty of vitall spirit sent over from the Heart through the Hollow-vein. Yet before it enters into the Liver, it disseminates in the way many sircles, and those partly from its upper side, partly from its lower: *from the upper side* two, first, that which I call *Pyloricus*, which arises in the mid-way, and being divided into many little branches is scattered into the back-side of the right orifice of the Stomach. The other is called *Cystica gemella*, the Twin-Arteries of the bladder of Gall, which are two little branches, and go into the bladder of Gall, and presently are divided into many propagations. *From the lower side* likewise two arise. The first is *Epiploïs dextra* or the right Kall-Artery, which is implanted into the right side of the lower membrane of the Kall, and part of the Colique-Gut annexed thereunto. The other is cleft into two branches, of which one called *Intestinalis*, the Gut-Artery passes on to the *Duodenum*, and beginning of the *Jejunum* or empty Gut: the other, named *Gastro-epiploïs dextra* the right Stomach and Kall-Artery, somewhat larger then the former, turns down to right side of the bottome of the Stomach, and being supported by the upper membrane of the Kall, issues out some shoots from the upper part to the fore and back-sides of the Stomach; but from the lower to that membrane of the Kall, upon which it leans. *The left and greater* branch is called *Arteria Splenica* the Spleen Artery, which sticking to the lower membrane of the Kall, and the Glandules placed therein, passes on together with the Spleen-vein, to which it is fastened, and in like manner distributes its propagations to the Spleen. But in the way likewise it distributes branches from both parts of it: *from the upper* issues *Gastrica* the Stomach-Artery, which reaches into the middle of the hinder part of the Stomach, or that, wherewith it leanes upon the back, and ascending from thence it compasses the left orifice of the Stomach round about like a crown, and dispersés little twigs, partly upward to the end of the Gullet, partly downward, and those greater, and more numerous, into the Stomach, and so it makes the *Arteria Coronaria* or Crown-Artery, like to the Crown-vein, which arises from the Gate-vein, as we have said in the fore-going Treatise. But *from its lower side* the Spleen-Artery sends out the *Epiploïs sinistra*, or left Kall-Artery, about that part, wherewith it now attains to the Spleen, which runs out into the left side of the membrane of the lower part of the Kall. This Artery presently after its rise is cleft into two branches, which part very far asunder from each other, from which many other Arteries arise, that are all consumed upon the said membrane of the Kall, and the Colique gut, that is tyed thereto. These branches being issued, the Spleen-Artery draws nearer to the Spleen, and just like the vein of the same name, which accompanies it all the way, is cleft into two branches like the Letter Y, one of which may be called the upper, the other the lower, which afterward entring by the hollow part of the Spleen are splintered into an infinite number of little sprigs, so that there are five times more Arteries there, then veins. Whence it comes to passe, that in inflammations of the Spleen, if you lay your hand to the left *Hypochondrium*, or place under the Gristles of the Bastard-ribs, it seems to pant. But before this entry of the Artery of the lower branch makes a notable *anastomosis* or inoculation with the lower branch of the vein, and propagates a twig to the lower membrane of the Kall. But from the upper branch issues one called *Gastro-epiploïs sinistra*, the left Stomach and Kall-Artery, which being fastened to the upper membrane of the Kal is derived into the left side of the bottom of the Stomach, bestowing little branches upon the fore and back-sides of it, or also upon the upper part of the Kall. Another issuing from the upper branch makes the *vas breve Arteriosum*, or short Arteriall vessell, carried, like the vein its name-sake, to the left side, and orifice of the Stomach. The use of the right branch, which goes to the liver, besides the common one, which it hath, is this, as often as the bladder of Gall is obstructed, to carry down choler to the Guts, and especially to the *Colon*, into which some of its branches are implanted. Which is the reason, that in bloudy Flixes the Ulcers are almost alwayes found in the great Guts, and especially in the *Colon*, very seldome in the small ones. For this artery, when either the Liver being over hot breeds abundance of choler, or the bladder of Gall is obstructed, receiving into itself store of choler carries it directly over to the *Colon*, or Colique Gut. In like manner the use of the left branch, or Spleen Artery, besides the common one, is to throw down choler, melancholy and wheay humors, if at any time the Spleen abound with them, to the Guts. Moreover by this same way the waterish humors in such as have the Dropsie, are sometimes committed either to the Guts, or to the Kidneys and Bladder. This same branch is that by which the drink passes so sodainly through the whole body, and by which ill humors are cast out by vomit. This same is the cause, that upon a full Stomach we make little water; but more when the concoction therein is finished. For the Stomach being much distended presses it; but that once empty, it can perform its office. This same branch teaches us that a slender diet is to be preseribed to them, who are to take purges, that the way may be open for the medicins, as well that, by which the

Propagations from its upper part.
1.
2.
From its lower part.
1.
2.
The left branch
Propagations from its upper part.
From its lower part.
Its division.
The use of the right branch.
VVhy ulcers are more frequent in the great guts.
The use of the cleft.

the excrements are sent over to the Stomach, as that, by which they are conveyed to the Guts. This same branch also, if you adde the two Mesentericks, is the seat of the hypochondriacall Melancholy. For this disease arising from the obstruction of the entrails, which are contained in the lowest belly, it is necessary that the arteries here should suffer very much, which the very Symptomes, that happen in this disease, may sufficiently inform us.

4. *Mesenterica superior.*

Mesenterica superior, the upper Artery of the Mesentery [y] arises a little below the Cœliacall, being distributed like the Meseraick vein (which is its companion) with numerous propagations into the Guts called *Ilium* and *Jejunum*, as also that region of the *Colon*, which reaches from the Hollow of the Liver as far as the right Kidney, and so for the most part into the upper part of the Mesentery. In which place it is to be observed, that the Artery sometimes lies upon the vein, sometimes on the contrary the vein upon the Artery, and so is carried betwixt both the Membranes of the Mesentery. But these Arteries in many places in the Mesentery have Glandules, which were made for the free perspiration of the vessels, and especially of the Arteries, whereby it comes to passe, that these Glandules labouring with a hard tumor, or *Scirrhus*, the vessels are compress, and a pining away of the whole body follows thereupon.

An observation.

5. *Emulgentes.*

The Emulgent arteries [z] are two, one the right, another the left one. Both issue out under the forementioned Artery, where the first, and second Rack-bones of the loins are coupled together by the Ligament. But they arise out of either side of the Trunk, although not directly over against one another, as also it is in the Emulgent veins, the right one being lower then the left. These Arteries, when they come to the Kidney, are cleft into two branches, with which they are inserted into the *sinus* or channels of the cavity of the Kidneys, and like the veins are consumed in an infinite number of little sprigs upon their substance. Their use, besides the common one, is to purge out the whey, which is found in great plenty in the Arteries.

Their use.

6. *Spermaticæ.*

The spermaticall, or seed-arteries [α] are likewise two, which arise out of the forepart of the Trunk of the great Artery, their originals touching each other; for the left Artery issues not from the Emulgent, as the left spermaticall vein does. Afterward in their descent they are made fast to the veins of their own side, and in men are carried through the processes of the *Peritoneum* or Rim of the Belly to the Testicles: but in women, when they come somewhat near to the Testicles, they are divided into two parts, one of which is carried to the Testicles, the other to the bottom of the womb. But the arteries do so come to the womb, that they only water it at the sides, and pierce not at all into the inner parts of it. Which truly came to passe by the great providence of wisest nature, since it had not been so safe to have brought them down to the inner surface of the womb, by reason that in the coming forth of the child very great issuings of bloud would be caused to the no small danger of the woman in Child-bed, if the Arteries had been annexed to the Womb on the inside. Hence also it is, that in the time of delivery they flow by little and little, not rushing down with violence.

7. *Mesenterica inferior.*

Mesenterica inferior, the lower Artery of the Mesentery [β], arises near to the *Os sacrum*, or great bone, a little above the division of the Trunk into the Iliacall banches, and goes into the left side of the *Colon*, and into the strait gut, descending with the hæmorrhoidall veins to the very end of the Fundament, and making the hæmorrhoidall Arteries. It is questioned concerning the use of both the Mesentericks, whether besides the common, they have any peculiar one. For *Galen* in his 4. of the use of the parts, seems to make mention of some other when he would have some part of the *chylus* to be attracted by them. And in the book, whether bloud be contained in the Arteries, in the fifth Chapter, he sayes: If we divide the lowest belly, and the inner membrane, we shall plainly see the Arteries in the Mesentery filled with milk in Kids newly yeaned, but in living creatures that are grown, full of something else. In which words Anatomicall experience teaches us, that not onely the Meseraick veins, but Arteries also do manifestly draw the *chylus* to them. Which being so indeed, it is altogether to be beleeved, that the *chylus* is either afterward transported by them into the veins, or else turned into bloud by the Arteries themselves. Nor will this seem wonderful to any one who shall consider also that the mothers bloud is conveyed through the Umbilicall Arteries to the child, whilest it is yet shut up in the Womb. But if the bloud which is received by the veins ought yet to be better worked, as any diligent inquirer into nature will conclude it ought; truly that which is received by the Arteries will require to be so much the more exactly laboured, by how much the better it is, then that of the veins. But it is so laboured in the Arteries themselves, and in the Spleen, being haled into the Cœliacall Artery, and carried to the Spleen. And this is an excellent use of the Mesenterick Arteries, whilest a man enjoyes perfect health, besides which wee will adde another also, as often as he leaves to be in health. For these Arteries take to them the excrements of the whole body, that they may carry them down to the Guts, in like manner as the veins do, by which nature doth both attract the *chylus*, and likewise expell the noisome humors out of the body, as choler, phlegm, and melancholy. Choler is thus expelled oftentimes in continuall and intermitting cholerick feavers, a solution whereof follows by a loosenesse. Phlegm is so

Its use.

expell'd, as often as bloudy fluxes happen to such as have the gout in the feet, which ease them of their pain, if the intent of nature be advanced by the help of a wise Physitian. Lastly melancholy is conveyed out by both the Mesentericks, but especially by the hæmorrhoidall branch; whence *Hippocrates* sayes, 6. *Epidem.* He which has the Emroids naturally, shall neither be troubled with the pain of the side, or inflammation of the lungs, nor with fellons or black pustles, called *Terminthi*, nor with the Leprosy, canker, or other diseases. For there is a very great sympathy betwixt the breast and the hæmorrhoidall artery, becau'e the trunk, out of which it arises, descending from the heart, presently after it first issues from thence, propagates the Intercostall branches. Moreover all black cholerick humours are purg'd by this means out of the whole body, that cankers, and leprosies cannot be caused by them. From these voluntary purgings which nature it self has found out, wee may now judg of such as are caused by the help of a Physitian, and may be termed Artificiall. For an opinion of some men hath prevailed much in our age, that the body cannot be purged by clysters, but only by those medicins, which are taken at the mouth. But I will not only believe, but also being taught it by experience can witnesse, that, if the clysters contain in them purging medicins, the whole body is very commodiously cleansed. For the whole colick gut receiving the matter of the clyster, the vertue itself of the medicin draws down the noisome humors by the arteries out of the *Aorta* or great artery. Which being granted, we may give a reason (what we have seen very often) why Suppositories made of white hellebore produce the some symptomes, as are wont to be caused in them, who have taken in white bellebore at the mouth. In like manner from hence we may fetch the reason; why the belly is strongly purged, the region about the navell, being anointed with purging medicins. For the vertue of the medicin is attracted by the arteries, and by them afterward it purges. These arteries are they, by which the disease of the colick is changed into the gout, and on the contrary the gout into the colick, as we have it in *Hippocrates*, 6. *Epidem. Sect.* 4. where he sayes: One, that was vexed with the pain of the colick on the right side, had some ease, whilest the gout held him; but this disease being cured, he was pained more. The reason hereof was this, because that humor, which caused the gout, was carried out of the joints to the colick gut, whereby the colick disease was increased. *Laurentius*, inquiring into the cause of this, refers us to hidden and unknown passages, to which, it seems to me, that we need not fly, if we say, that the humors are brought out of the crurall arteries into the trunk, and out of this into the Mesenterick branches, and lastly, out of these into the guts; for this is the shortest, and most convenient way. Nor is there any reason, that we should be a fraid of that pollution of the vitall spirits, which they will object to us if the excrementitious humors passe through the arteries; for this betrayes their great ignorance as well in Anatomy, as in solid physick; and it would be very easie, if I would digresse, to prove in this place, that a great part of the humors in our body flow down through the arteries. For in them the strength of nature exceeds, and is more vigorous, that whensoever it is provoked, it is most apt to expell; and the bloud being stirred by their continuall beating, as also by its own nature, makes all that is therein more fit to flow. And who will not beleeve that excrements are carried through the arteries, who considers the flowings down from the spleen, in which there being five times more arteries, then there are veins, truly it is necessary that that ballast of the spleen be carried out through the arteries?

An observation.

VVhy anointing of the navell with such things as purge, loosen the belly.

How the colick is changed into the gout, and on the contrary.

2. *Lumbares.*

The four *Lumbares* or loin-arteries [γγγ] arise out of the backside of the trunk of the great artery, all along as it passes through the region of the loins. They run through the common holes into the rack-bones of the loins, and to their marrow, and also into the neighbouring muscles. And at the side of the marrow, after they have entred the rackbones, they climb upon both sides to the brain together with the veins of the loins. But they are all equally big, if you except those two, which issue out near to the *os sacrum* or holy-bone, which are not only derived into the rack-bones to the marrow, and to the muscles thereabout, but are also sent overthwart through the *peritonæum*, and muscles of the *Abdomen*. The two last are by some called *Musculæ superiores* the upper muscle-arteries, and are distinguisht from the *Lumbares*. And these are the arteries, which if we observe, we shall easily give the reasons of many things, of which Physicians do still dispute very hotly; but especially of that most difficult question, which is controverted among Physitians, by what wayes, and in what manner the colick ends in a palsie or in the falling sickness. For we have the observation in *Paulus Æginetalib.* 3. *c.* 43. where he sayes: the colick, as it were by a certain pestilent contagion, ended with many in the falling sickness, with others in a resolution of the joints or palsie, their sense remaining; and they who fell into the falling sickness, for the most part dyed; but they who fell into the palsie, were most of them preserved; the cause of the disease being carried to another place in the solution. For the humor, that caused the disease, came back out of the colick gut through the mesentericall arteries, from whence being afterward transported into the trunk of the great artery, it came also to the *lumbares* or arteries of the loins, which swelling with bloud prest together the neighbouring nerves, from which came the palsie in the feet. And this we have often observed, as well in our selves, as in others, especially in former years, when these dis-

How the colick disease ends in a palsie or Epilepsie.

eases

eaſes at *Padua* were Epidemiall. Yet the Palſie is not alwayes a perfect one, but often (as I am wont to call it) imperfect, becauſe the power to walk is not wholly taken away, but the diſeaſed ſtand upon their feet with a great deal of difficulty. Many at that time being deceived in the knowledge of the diſeaſe, miſtaking this for a great weakneſſe of body contracted by their ſickneſſe, endeavoured to take it away by eating and drinking largely, but in vain. This alſo is the cauſe, why the Falling-ſickneſs, and Lethargies too, as we have oft-times ſeen, follow after the Colick, becauſe the matter being ſent over from the Meſenterick arteries to thoſe of the loins, may eaſily go from them into the brain, to which thoſe very veſſells are carried.

But the trunk of the great artery, when it is come to the laſt rack-bone of the loins, having taken its journey all the way, which we have ſhewed, under the hollow vein, at the left ſide, here gets above the vein, leſt it ſhould be worn away in that continuall motion by the hardneſs of the holy-bone. But it is divided, no otherwiſe then the hollow vein is, into two notable branches [S. S.] which are called by Anatomiſts the Iliacall arteries from their ſituation, and being carried downward obliquely to the thigh reſemble the ϒ of the Greeks turned upſide down. But they alſo juſt like the Iliacall veins, to which they are exactly anſwering, before they be implanted into the thigh, ſhoot out a pretty number of branches. But from the lower ſide of the artery before the Iliacall branches be divided, iſſue forth *ſacræ* the holy arteries [ϕ] which are notable ones, and carried downward, leaning upon the holy-bone, paſſe through the holes thereof, and run to the marrow and backſide of the bone. And through theſe alſo there is a way for the matter, that makes the Colick, to cauſe the Palſie of the legs. *Sacræ.*

After this a little below the diviſion of the trunk, the Iliacall arteries are ſubdivided into two branches, one of which is the inner and leſs; the other outer and greater. *The leſſe and inner* [T] iſſues out two propagations, one from its outſide, the other from its inſide. *The outer* [ε] is commonly called *Muſculs*, by us more ſtrictly *Glutæs* the muſcle of the buttocks, becauſe it runs down with its name-ſake vein, betwixt the holy and hip bones, where they part one from another, and ſcatters many twigs into the muſcles, which lye upon the *Os Ilium*, or hanch-bone, called *Glutæi*, or the muſcles of the buttocks; becauſe they are the authors of them. The diviſion of the Iliacall arteries into an inner and outer branch. Propagations of the inner or leſſe branch. 1. *Glutæa.*

The inner is called *Hypogaſtrica* [ζ] which is very notable, and large, and, being carried directly down to the lower ſide of the holy-bone, it affords certain propagations in men to the bottome, and neck of the bladder, as alſo to the ſtrait gut, which alſo may bee called the Hæmorrhoidall arteries; but in women, to whom this branch is ſomewhat larger, it diſtributes a great number of propagations, beſides thoſe to the fore-named parts, into the lower region alſo of the bottome of the womb, and likewiſe into its neck. Hence we may gather the reaſon, why, if the womb reach to the middle of the hip, Convulſions are cauſed, as *Hippocrates* witneſſeth, *lib. de natura muliebri*. As alſo if the womb fal down to the hip, why the monthly flowers are ſuppreſt, and a pain is cauſed in the ſoftneſs of the ſides, and in the loweſt belly. For the blood which nature drives to the wombe, cannot bee laid in there, the arteries being preſt together by the falling down of it; ſo that neceſſarily flowing back, it fils the neighbouring veins and arteries, which ſwelling up cauſe theſe pains. For wee have oft-times ſeen in diſſections theſe veins ſo ſwoln, that they have been ſeven fold bigger then themſelves. Hence alſo a reaſon may be given of the thirty ſecond Aphoriſm of the fifth ſection in the ſame *Hippocrates*, where he witneſſes, that a woman vomiting blood is rid of her diſeaſe, upon the iſſuing forth of her tearms. Which happening by the conſent of all by revulſion or attraction of the humour to a contrary part, and that not by the benefit of the veins, becauſe the veins of the ſtomach ariſe out of the gate-vein, but they of the wombe from the Hollow one; there is no other ſympathy to bee ſought for, then that which is cauſed by the arteries, eſpecially when the Hypogaſtrick or artery of the lower part of the loweſt belly is not far diſtant from the Cœliacall, or artery of the ſtomach. Hence likewiſe a reaſon will be given of the Aphoriſm that follows this, wherein he judgeth the *Hæmorrhagia* or abundant iſſuing forth of blood at the noſtrills to bee profitable when the monthly courſes do fail. The remaining part of the leſſer Iliacall artery deſcends, and brings forth the Umbilicall or navell artery [ηη], which is carried down near to the length of the great artery, and is tyed with ſtrong membranes to the ſides of the bladder of urine. But it loſes its hollowneſſe in thoſe that are once out of the wombe. After this [θ] like the Iliacall vein which is joined to it, it goes through the hole of the ſhare bone, or *os pubis*, which before it be paſt, it takes to it a propagation iſſued from the outer Iliacal branch, and ſo goes out of the hole, and being departed from it ſpends it ſelf, in like manner as the inner Iliacall vein does, upon the muſcles; partly thoſe with which the hole is ſtopt; and partly thoſe which ariſe from the ſhare bone. At length being terminated at the middle almoſt of the length of the thigh, the end of it meets [ο], and is united with the ends of the branches [ν] of the inner muſcle-artery of the leg, of which we ſhall ſpeak in the next Chapter. 2. *Hypogaſtrica.* *Arteria umbilicalis.* Propagations of the outer or greater Iliacall branch.

The greater or outer Iliacall artery [V] produces likewiſe two propagations; the *firſt* of which [i] is called *Epigaſtrica*, which ariſing from the outſide of it, a little before it paſſes through the *peritonæum* or rim of the belly is reflected upward, and aſcends by the inſide of the ſtrait muſcle 1. *Epigaſtrica*, or the artery of the upper part of the lower belly.

muſcle til about the navel it be inoculated with the deſcendent Mammary artery. The other [λ] is called *Pudenda*, which is a little inner propagation, being not divided into ſo many branches, as the vein of that name is. But it ariſes preſently after the artery is gone out of the *peritonæum*, and being carried overthwart along the commiſſure or joyning together of the ſhare-bones, is ſpent at the privy parts upon the skin of the yard. That which remains of this trunk goes into the *crus* [X], whereof we ſhall now ſpeak.

Pudenda or the artery of the privy parts.

CHAP. IV.

The propagations of the outer Iliacall branch, which are diſtributed through the Crus *or great foot, containing the thigh, leg, and foot.*

AFter that the outer branch [V] has propagated the fore-mentioned branches, it departs out of the *peritonæum* or rim of the belly, and at the groin is carried into the *crus*, by the ſame way which the crurall vein takes, under which it goes, and is joined in company therewith every where, and ſo it makes the trunk of the Crurall arterie [X], (as we will alwaies call it). But preſently after it hath got beyond the *peritonæum*, it iſſues forth a propagation from the outſide, which is called *Muſcula cruralis exterior*, the outer muſcle-artery of the *Crus*, which being carried downward is propagated into the muſcles that cover the foreſide of the bone of the thigh. Sometimes over againſt this, but oftner a little below, yet of the inſide another is brought forth, called *Muſcula cruralis interna*, the inner muſcle-artery of the *Crus*, [ρ] which is diſtributed in many branches through the third bending muſcle of the thigh, called *Triceps*, and thoſe on the inſide of the thigh, as far as the knee; the ends of which branches are joined with the end of the inner Iliacall artery, which we told you deſcends through the hole of the ſhare-bones to the *Crus*. Theſe propagations being diſpatcht away, the crurall trunk deſcends from the groin, together with the crural vein; and is ſo bent backward near to the bone of the thigh, that when it is come to the ham, it ſtands betwixt the two hindmoſt heads of the thigh. For prudent nature does alwaies obſerve this, to carry down the veſſells about that ſide of the joint where the bending is, leſt if they ſhould go on that ſide whereon the joint is extended, they ſhould be compreſt. But in the very mid-way as it were, as it runs down through the thigh, it ſends out a propagation [π] which breaking into more ſurcles runs out through the muſcles that are ſeated on the backſide of the thigh, together with the ham-vein; and at length deſcending through the ham (whence it is called *Poplitea* the ham-artery) is diſtributed with many ſprigs into the calf of the leg. But whilſt it ſtayes in the ham, it ſends out a propagation [ϱ ϱ] on each ſide, to the ſides of the joint of the knee, which then ſinking deeper, are conſumed partly in the joint it ſelf, partly upon the muſcles called *gaſtrocnemii* that make the calf; from whence they are called *Surales*, the arteries of the calf.

The trunk of the crurall artery and its propagations ere it bee divided.
1.
2.
3.
4.

After that the Crurall trunk lyes in the ham [Y], it ſends forth a propagation from its outſide [σ] which runs down near to the *Fibula* or leſſer bone of the leg, and is hid betwixt the muſcle, that moves the foot outward, and the ſecond bending muſcle of the inſtep, and diſtributes it ſelf into the reſt, that lye on the forepart of the leg, as far as they are fleſhy, and till they begin to be contorted by the outer ankle. A little under this ſame another artery [τ] is brought forth out of the backſide of the trunk, which runs down as far to the mixing together of the tendons of the calf-muſcles. Then another [υ] iſſues out of the ſame backſide of the trunk, but under the ſecond, which deſcending and paſſing through the tranſverſe ligament, runs down by the top of the foot, and is diffuſed into the muſcles that move the toes outward. The remainder [τ] of the trunk is carryed downward by the backſide of the leg, and about the inner ankle offers a ſurcle [φ] to the foot, which goes to the muſcle of the great toe, and creeps through the top of the foot. But the trunk it ſelf lying hid among the tendons of the muſcles of the toes is cut [χ] into two branches; of which the Inner [ψ] beſtowes two ſurcles upon the great toe; two upon the fore toe, and one upon the middle; the outer [ω] two upon the little toe, and two upon the toes next to it, on the lower ſide. But although the progreſſe of the arteries be for the moſt part ſuch, as we have deſcribed, yet what we have ſaid formerly of the veins, that their diſtribution varies much, not only according to the diverſity of bodies, but alſo of ſides in the body of the ſame man, is true alſo of the arteries, which in divers men are diverſly diſtributed.

AN

An Explanation of the Table of the Arteries.

This Table comprises the delineation of the great Artery, entire and free from all the parts.

A THE large beginning of the great artery, where it issues out of the left ventricle of the heart: but presently after its rise, and before it yet falls out of the pericardium or purse of the heart, it shoots forth the two Coronary arteries,
a a a, a, which encompasse the basis of the heart in manner of a crown.

B But presently having past the pericardium it is divided B into two trunks; one of which is the Ascendent C, the other the Descendent one Q.

C The Ascendent trunk C, is by and by divided into the two subclavian arteries
D D D, both which when they have attained to the first rib, scatter many propagations; partly from the higher, partly from their lower side.

From the lower side issues Intercostalis superior, the upper artery
b between the ribs, b, communicating particular twigs to the distances of the four upper ribs.

From the higher side issue three. The first is vertebralis, the artery of the
c rack-bones, c, creeping on by the transverse processes of the rack-bones of the neck, as far as to the skull. The
d second mammaria the artery of the dugs, d, which descending under the breast-bone, runs out as far as to the seat of the navill, and distributes sprigs into the distances of the gristles of the true ribs, and then into the muscles that lye upon the breast; at length about the navill it joins by anastomosis or inoculation, x, with the ascending Epigastrick artery, 1. The third cervicalis or the artery of the back side of the
e neck, e, is propagated to the muscles on the back side of the neck, as far as the novel of the head.

These branches being issued out, the subclavian artery goes to the arm-pit,
E and takes the name of Axillaris, about E, and so is diffused into the arm. Yet before it enters thereinto, it shoots out some twigs from both parts of it: from
f the lower three; of which the first, f, is called scapularis interna the inner blade artery, because it is spent upon the muscles that cover the hollow side of the shoulder-blade. The second is Thoracica superior the upper
g chest artery, g, dispersed into the muscles on the foreside of the chest. The third

h h, Thoracica inferior the lower artery of the chest, which descending along the sides of the chest, is inserted into the muscle called Aniscalptor, that moves the upper part of the arm backward. Betwixt g and h a little branch is placed, one of them which here are disseminated into the glandules of the arm-pit. From the upper part
i issues one, i, called scapularis externa the outer blade artery, being disposed of into the muscles, on the outside of the shoulder-blade.

FF In this place the axillary artery changes its name, and is called Brachialis the trunk of the arm, that is undivided as far as G, scattering two twigs
l m l and m into the muscles that cover the bone of the upper part of the arm on the
n n back side; and two other n n, one of each side about the bending of the cubit.

G The parting in twain of the Brachiall artery under the bought of the cubit into an outer H, and inner branch I.

H The outer branch of this division, or Radicus, running straight along the
o radius or lesser bone of the cubit to the wrist, and distributing a branch o into the muscles seated betwixt the first bone of the thumb, and that of the metacarpium or after-wrist, which sustains the fore-finger, and then three other, P P P, which are dispersed into
P P P the first outer fingers, the thumb, and wit, the two fingers next thereunto.

I The inner branch, or Cubitcus passing along the greater bone of the cubit, is at length consumed in a double branch upon the two inner fingers; to ring-finger and little one.

L The remaining part of the Ascendent trunk, which near to the upper part of the breast-bone is cleft into two bran-
M M ches M M called Carotides, or the sleepy arteries. These tend directly upward by the sides of the neck, and being come to the chops are divided into two
N branches about N, one of which is the outer O, the other the inner P.

O The outer Carotis propagates twigs 4 to the Buccæ or cheek puffes,
q and to the muscles of the face; but about the ear it is cut into two branches,
r a formost one, q, which is caried through the Temples; and a hinder one, r, that is disseminated along the back side of the ear under the skin.

P The Inner Carotis, going to the skul is divided near to the basis thereof into two branches; of which the one
s and lesser, s, which goes into the sinus on the side of the thick membrane, is cut off here, whereabout it sinks into

the

t the skull: the other and greater, t, enters the skull, through a peculiar hole bored for it in the temple-bone.

Q The Descendent trunk of the great artery, reaching downward to the rackbones of the back.

From this before its division at ρR, many propagations are scattered, which we will now rehearse in order.

First then are Intercostales inferiores, the lower arteries between the ribs, u u u, distributed to the distances of the eight lower ribs, from which propagations are brought to the marrow of the back-bone; and to the muscles that grow to the back and chest. After this the trunk passing on distributes two more, called Phrenicæ the arteries of the midriffe x x, because they are disposed of into the midriffe. Then follows Cœliaca or the stomach. After that Mesenterica superior, the upper artery of the Mesentery, y, reaching out into the guts Jejunum, and Ileum, as also into that part of the Colon, which reaches from the hollow of the liver as far as the right kidney. After this the Emulgent arteries, z, propagated to the kidneys. Then spermaticæ, the seed arteries, α, going to the testicles, under which is Mesenterica inferior the lower artery of the Mesenterie, β, departing into the left side of the colick, and into the strait gut, and making the hæmorroidall arteries. Lastly Lumbares the arteries of the loins, γγγ, which going to the rackbones ο, the loins joint by joint, are distributed, into the peritonæum or rim of the belly, and the muscles growing to the rack-bones.

R These branches being issued forth, the trunk about the fift rack-bone of the loins, is divided into two branches S S called the Iliacall, both which are again broken into two other, an inner branch T, and an outer one V. But before this division in the very parting in twain of the Trunk, arises sacra the holy artery δ, distributed into the holes of the os sacrum or holy bone, to the marrow thereof.

T The inner Iliacall artery, before it falls out of the peritonæum, issues forth two propagations: from its outer side, that called glutæa, ε, distributed into the muscles of the buttocks; from its inner side, that called Hypogastrica, ζ, going into the bladder and yard, and in women also to the bottome of the womb. After this it runs down, and sends forth the umbilicall arteries η η, that tend upward near to the length of the great artery.

θ The remainder under θ, taking to it a propagation from the outer Iliacal artery, slips down through the hole of the share-bone into the Crus, the end of it joining about ε with the inner muscle artery of the Crus ρ.

V The outer Iliacall artery likewise before its going forth of the peritonæum produces two. The first is called Epigastrica, ι, digested into the muscles of the Epigastrium, and the straight ones of the abdomen, where it is joined by inoculation, κ, with the descending mammary artery d. The other called Pudenda λ, goes to the privy parts.

X In this place the outer Iliacall artery having past the Peritonæum, enters the Crus, and begins to be called the Crurall trunk, which issues out more propagations. The first is Musçula cruralis exterior, the outer muscle artery of the Crus, μ, that is propagated into the muscles, that cover the foreside of the Thigh-bone. The second is the inner muscle-artery of the Crus, ν, digested through the third bending muscle of the thigh; and those muscles that are on the inside of the thigh; the endo of it are joined with the ends of the inner Iliacal artery about α. The third is Poplitea, the ham-artery, π. running out into the muscles on the back-side of the thigh. The fourth is suralis the calf-artery ρ s, which is double, issuing out there, where the crurall trunk is hid betwixt the two lower heads of the thigh, and spreading out on both sides into the joint of the knee, and the two heads of the first extending muscle of the foot.

Y Here the great artery lyes in the ham, where it is divided into branches of unequall bigneſſe.

σ A sprig issuing from its outside, and reacht out to the fibula or lesser bone of the leg, betwixt the musole that moves the foot outward, and the second bending one of the instep.

Z The trunk descending by the back-side of the leg.

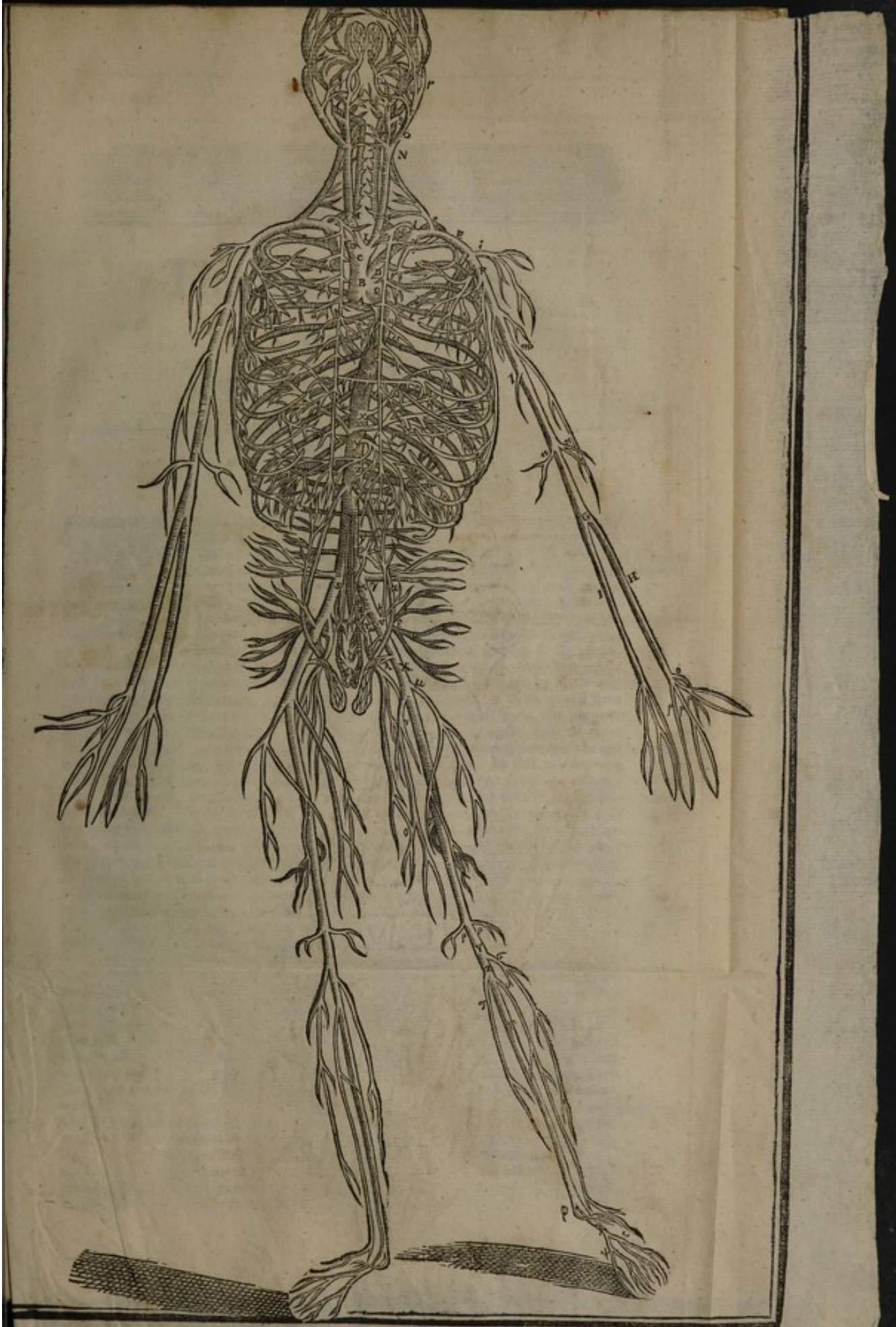
τ A higher branch issuing out of the back-side of the trunk.

υ A lower branch issuing out of the back-side of the trunk.

Γ The remainder of the trunk descending by the leg, which offers a little branch φ to the inner ankle.

χ The division of the trunk χ into an inner branch ψ that is propagated to the great toe, and the two next; and an outer, ω propagated to the little toe, and the two next to that.

THE



The third Treatise,

Concerning

The NERVES.

CHAP. I.

Of the nerves of the brain.

AMong those eight Conjugations, which arise from the marrow of the brain drawn out in length, whilest it is yet contained within the limits of the skull, *that* offers itself in the first place, *which makes the Optick nerves*, that are so famous among all the Masters of Anatomy. The first pair of the brain. For these are not only the biggest, if you look upon their thickness; but also without doubt the softest of all the nerves of the body. But they arise out of the middle of the *basis* of the brain, on the Its originall. forepart, according to the opinion of the Ancients, but indeed, if the head be turned upside down in the dissection (which is the proper way) out of the beginning of the former trunks of the spinall marrow, that their originall is as it were in the back part of the head, and presently each of them by little and Progresse. little making towards its mate, they are united (not only joyned, as some would have it) over the saddle of the wedg-bone, and make one common square body, the marrow within them being mixt together. After that presently separating again, each of them is carried obliquely into the eye of its own side, entring the orb thereof through the first Insertion. hole of the wedg-bone, and ending at the very centre of the eye. In this pair we may easily shew those two membranes, which are derived to the nerves from the two *meninges* of the brain, as also the very inner marrowy substance, which comes from the body of the brain. Yet the nerve it self is not cleft into more branches, (as the other are) but lying hid makes the coats of the eye; and out of the thick membrane it forms that coat, which is called *Cornea*, the horny one; out of the thin membrane that is called *Uvea*, the grapey one; but out of the substance of the marrow the *Retina* or coat like a net. For as soon as it is arrived at the centre of the eye, these membranes are displayed, and making a sphere contain the humors in them. These nerves convey the faculty of seeing to the *Use.* eyes; wherefore, they being obstructed, or compresst, a blindnesse insues. *Galen* hath a- The holes of the optick nerves. scribed holes to them, and *Herophilus* for the same reason called them πόροι ὀπτικοὶ, the passages of the sight, teaching that there is a sensible hollownesse plainly to be seen in them, whom for all that almost all Anatomists do contradict. But I have heretofore shewen in the Universitie of *Padua*, and in a great assembly of men, that there are certain passages continuing from the beginning of these nerves, as far as to the place, where they meet together, and presently after that vanishing away toward the eye. And therefore I shewed that the Ancients may not only be excused, but also that they writ the truth, especially when none of them have said, that these passages were great, but only such, as did not altogether escape the sight, if one would make tryall thereof in a great living creature, and by a clear light, and presently after it is killed. For *Galen* himself requires these three conditions, 7. *placit.* 4. and *lib. de oculis*, that one may see them. But before we depart hence, I will bring in some problemes, that, besides the history itself, I may Problemes. also shew the use of that, which I say, especially when in our time they only for the most part follow the study of Anatomy, who imploy their industry in the behalf of Physick. The first therefore shall be, what is the cause, that many upon sneesing often (especially when they have provoked it for the nonce) have of a sodain faln blind. This happens, either because the branches of the sleepy arteries, which are so near to the optick nerves, that they touch, are filled, and being so, presse together those nerves; or else be- 1.

cauſea copious, and that a phlegmatick humor has faln out of the brain into the optick nerves, and obſtructed them. I have ſeen thoſe, that have been blind through the firſt cauſe, ſometimes cured by a Seton; but I never remember, that any, in whom this aroſe from phlegmatick humors, have recovered, except one having the French pox, who being anointed with quick-ſilver, all the humors melting away, was reſtored to health. But it is not the part of a good and pious Phyſitian, to make uſe of thoſe things, which, being full of danger, may do more harm, if they prove hurtfull, then they can procure good, if they be profitable. And truly it is better not to cure blindneſſe, then to cauſe death; although oftentimes raſhneſſe helps them, whom reaſon helps not, as the moſt elegant of Phyſitians *Celſus* ſayes elegantly. In the mean time in diſeases of the eyes, they who practiſe Phyſick, may learn rather to adminiſter thoſe things, which bring the phlegm out by the palat, then to draw the noxious humors to the noſtrils. That I may conceal beſides the danger which they avoid, that more profit ariſes from the medicins, that void the phlegm out of the head through the mouth; which both long experience hath hitherto taught, and Anatomy perſwades, when the optick nerves in their originall are not far diſtant from the palat; but farther from the ſpongy bone, and it is a preternaturall way, by which the humors are carried, as hath been already demonſtrated by
2. the learned *Veſalius*. Then it is diſputed, by what means the eye can fall out of its orb. the optick nerve not being broke, whereof we have very many hiſtories. But it is not hard to give an anſwer, to wit, that the nerves may be very much extended in length. Whileſt therefore this nerve receives much moiſture in the inflammations of the eyes, it eaſily comes to paſſe, that it is ſlackned; but the muſcles themſelves ſwelling very much, when they can no longer be contained in the orb, leap forth out of it. For this falling forth of the eyes moſt commonly proceeds from inflammations; ſuch as are the ſtories of the moſt learned *Vega*, who cured a woman in this caſe by procuring the flux of her terms,
3. and a young man by digeſting ointments. But the queſtion is very worthy to be made mention of, and that gives me an occaſion to explain it, which I have read in ſome Authors, that ſuch as were before blind, upon receiving of a wound overthwart the fore-head, and ſome, upon a great looſneſſe of the belly ariſing on a ſodain, have received their ſight, and that preſently. The cauſe of their blindneſſe was no other, then the compreſſion of theſe nerves proceeding from the neighbour-veſſels, to wit, the veins, and arteries being ſwoln with bloud, which ſuch a wound preſently emptyed. Wherefore I alſo ſometimes, and not without ſucceſſe, in that *ſpecies* of blindneſſe, which the Barbarians call *Gutta ſerena*, open the middle vein of the fore-head, out of which I draw bloud ſo long, till it ceaſes to run of its one accord.

The ſecond pair. Its originall.

The ſecond pair ariſes, as the ancient Anatomiſts ſay, from the ſides of the *baſis* of the forepart of the brain, near to the originall of the firſt pair. But the new diſſection ſhews, that it iſſues out at the inſide of the beginning of the ſpinall marrow, and that they are ſo united in their originall, that they make one common angle, which is the cauſe why both the eyes are moved together to the ſame ſides. It is much ſmaller, if you compare it with the firſt pair, and harder, and goes out of the skull through the ſecond hole of the wedg-bone, which is ſomewhat long, and ſo it enters the orb of the eye. By and

Branches.
1. by it is divided into many ſprigs, which goe to the muſcles of the eye; and *the firſt* climbing up above the firſt pair, or the optick nerves, is diſpoſed of into the two muſcles, as well
2. that, which lifts up the eye-lip, as that which lifts up the eye. *Another* very conſpicuous
3. one is diſſeminated in many ſurcles into the muſcle, which moves the eye inward. *The third*, no contemptible one neither, being divided firſt into two fibres, and by and by into more,
4. is ſent into the muſcle, that draws down the eye: *the fourth*, into the lower or leſſer of the oblique muſcles, that rowls the eye about toward the other angle. At length it iſſues out ſome thin fibres, which being joined with the firſt pair are diſtributed to the outer membranes of the eye, ſo that this ſecond pair is propagated only to four muſcles of the eye, and
Uſe. to that, which lifts up the eye-lid. The uſe of this pair is, to impart the faculty of motion to the muſcles of the eyes.

The third pair. Its originall. Banches. 1.

The third pair ariſes with a very ſmall nerve out of the lower, and hinder part of the marrow of the brain, and runs directly forwards under the *baſis* of the brain, being tyed to the ſecond conjugation, together with which it enters into the orb of the eye through the ſaid ſecond hole of the wedg-bone. By and by it is divided into four branches, of which *the firſt* offers a little branch to the upper, and greater of the oblique muſcles of the eye, or that called the muſcle of the pulley, and then falling out through the hole of the fore-head-bone above the orb of the eye, in the skin, and muſcle of the fore-head,

An obſervation. which ought rather to be called the muſcle of the ey-brows. This branch is diligently to be taken notice of, becauſe I have long ſince obſerved, that, it being hurt with a ſlight wound the eye-lid fell down, whileſt the muſcle of the eye-brow by reaſon thereof fell into a Palſie. I have ſeen alſo the ſame palſie cauſed by cold, and narcotick medicins, ſomewhat unreaſonably applyed for the procuring of ſleep. But hence alſo a reaſon may be rendred, why *Hippocrates* 1. Prognoſtic. reckons it among the ſigns of death in acute diſeaſes to ſleep with the eyes half open. For this is an ill ſign for that reaſon, becauſe it ſignifies,

thas

that the nerves are very much dryed, and ſo the brain itſelf, whence it comes to paſſe, that they, who are ſo diſeaſed, for the moſt part ſuffering convulſions afterward dye. In ſome alſo a fore-runner of the Falling-ſickneſſe is wont to ariſe from the ſame cauſe in the eye-lids, the eyes, and the whole face, when this third pair is pluckt by the humors begetting the falling-ſickneſſe, and ſo a convulſion of the eyes, and face is cauſed. *The ſecond* branch is carried downward, and falls out through the hole of the fourth bone of the upper jaw, which is under the orb of the eye, and preſently ſcattering into more propagations, on the forepart of the face, is ſpent upon the muſcles, that move the upper lip, and wing of the noſe outward, as alſo upon the lip itſelf, and the gums of the teeth, called *Inciſorii*, or ſhredders. *The third is* ſent through the hole of the ſecond bone of the upper jaw, behind the caruncle, that is placed in the inner angle of the eye, to the wide cavity of the noſtrills, being ſpread throughout its coat, whereby it comes to paſſe, that it is indued with a very ſharpe ſenſe, and being but lightly touch't cauſes ſneezing. *The fourth* goes out through that creviſe, which is betwixt the firſt bone of the upper jaw, and the wedg-bone, in the outer angle of the eye, or through the fourth hole of the wedg-bone, and departs to the inner ſide of the temporall muſcle. The uſe of this pair is to convey the faculty of moving to the ſaid muſcles. 2. *Uſe.*

The fourth pair ariſes out of the marrow of the brain on the backſide, goes out of the skull through the ſixt hole of the wedge-bone, and running ſtraight down, propagates three branches from itſelf. *The firſt* is preſently after its going out of the skull, which being writhed ſometimes about in manner of the tendrells of a vine, or gourd, and united to two ſprigs of the Auditory nerve (of which we are to ſpeak next) afterward diſtributes ſurcles to the temporall muſcle, that lifts up the lower jaw, and that which moves it forward from the head, as alſo to the muſcles of the cheeks. After this the pair running farther down, iſſues forth a *ſecond* branch, which propagates ſurcles in order to the gums of the upper cheek-teeth called the grinders, and alſo to the teeth themſelves. *The third* branch iſſuing forth from the backſide of the nerve, and entring the hole of the lower jaw-bone that is bored in the inner ſurface of it, at the originall of the proceſſes, beſtows little branches in order to the roots of the teeth, and at length going forth through the foremoſt hole in the outer ſurface is terminated in the lower lip, and skin of it. The remainder of this nerve is ſpent upon the coat of the tongue near to the root, and ſo gives it the power of diſtinguiſhing ſapors or taſting. The fourth pair. Its originall branches. 1.

But note in this place, that theſe two pairs which we have now recounted, I ſay, the third and fourth, are commonly reckoned for one by Anatomiſts, and that the third; but with this diſtinction, that they ſay this very pair ariſes with a double root; the one ſmaller, and the other thicker. They call that the ſmaller root, which wee ſet down for the third pair; that the thicker, which we make the fourth. But we diſtinguiſh them, becauſe indeed they are not joined together, neither in their originall, nor in their progreſſe. But that which they account for the fourth pair, ſeems not to bee diſtinguiſhed, from the third; as *Valuerda* himſelf grants, *lib. 7. Anatomiæ. cap.* 4. A note.

The fifth pair iſſues out of the marrow of the brain drawn out in length, on that ſide whereon a part of the *cerebellum* or after-brain is joined to it, ariſing out of two nerves, of which one is ſofter, the other harder. Theſe go out of the membrane together, and enter the organs of hearing, through the hole of the temple-bone, that is bored in the ſtony proceſſe thereof, being a large one and winding. After this that *harder* part goes forthwith to the foreſide, being carried through a peculiar channell, and returns backward again obliquely through the ſame bone, and departs into the firſt cavity of the inner ear. From thence being more reflected, it ſends forth two propagations, one higher, the other lower; but both paſs through their peculiar holes. *The upper* is carried through the tranſverſe hole of the ſame bone, through which alſo a little vein paſſes into the organ of hearing; and a little after it is come forth of it, is joined with that branch of the fourth pair (as we have delivered; but as other commonly count the pairs of the third) which we told you was writhed about, like the tendrell of a Vine. *The lower* goes out through the third hole of the ſame bone, which is very narrow and winding; and being carried overthwart above the muſcle of the lower jaw, that moves it ſidewards, deſcends into the chops, having diſſeminated a pretty many propagations into the noſtrills. But forthwith it is joined with the propagation of the fourth pair, that reſembles the tendrell of a Vine, or that ſprig which goes to the tongue, from which it paſſes to the roots of the teeth, and muſcles of the cheeks, as alſo to the skin that goes about the root of the outer, or little ear. Anatomiſts do beleeve, that by means of this branch it comes to paſſe, that they who are born deaf, are for the moſt part dumb alſo. But that *ſofter* part of this pair is carried together with the hard part; and when it is come to that firſt cavity of the inner ear, it is ſpread throughout it in manner of a membrane, and ſo it deſerves to bee called the Auditory nerve, as miniſtring all the ſpirits, that ſerve for hearing. The fifth pair. Its originall. Its two parts. The harder. The ſoft part. Its uſe.

The ſixth pair ariſes ſomewhat more toward the lower and hinder part, then the fifth, and The ſixth pair Its originall.

and not with one, but with many little nerves ſevered from each other, which for all that are preſently joined together, although they do not cloſe ſo, as to make one only, but two diſtinct ones alwaies, yet are they contained in one membrane, ariſing from the *Dura meninx* of the brain, which hath deceived many, ſo that they have accounted them for one. Being thus joined, they deſcend both together out of the skull, through the ſecond and third hole of the nowl bone; through which ſame the leſſer branch of the ſleepy artery, and the greater of the Jugular vein enter into the skull. There being then two nerves, the *one* in its egreſſe inclines more to the forepart of the ſaid hole, and is the leſſer of the two; the *other* to the hinder part, and is the *greater*. *That* preſently after its going forth of the skull, tends ſtraight downward to the muſcles of the tongue and chops, and to the parts placed in the mouth, upon which it is wholly conſumed.

The leſſer nerve.

This on the contrary ſends its firſt propagation to the muſcles ſeated on the backſide of the neck, eſpecially to the firſt muſcle of the ſhoulder-blade, called *Cucullaris* or the cowl-muſcle, and then adhering to the ſeventh pair, and the aforeſaid artery and vein, by the benefit of certain membranes, it runs down to the ſides of the throtle, to whoſe muſcles, eſpecially thoſe ſeated in the inner cavity, it diſtributes ſurcles overthwart. Here many propagations of nerves meeting together, and parting aſunder again, a certain texture is made, wherein knots are found not unlike to the glandules, that are tyed to the divarications of the veſſels; which was firſt obſerved by the moſt learned Anatomiſt *Fallopius*, who would have it reſemble the body of an olive. But the greater nerve it ſelf going in the middle betwixt thoſe ſame veſſells which I ſpake of, is carried leiſurely from the throtle to the rough artery, and running down at the ſide thereof, tends to the cheſt.

The greater nerve, and its propagation.

But before it enters thereinto, it is divided over the hollow of the neck into two branches, of which one is the outer and leſſe: the other the inner and greater. We ſhall now ſpeak briefly of the diſtribution and propagations of them, but ſo that being the right trunk is diſſeminated in another manner then the left, we ſet down the hiſtory of each by itſelf; and firſt of the right, then of the left.

The branches of the greater nerve.

The outer branch then of the *right* nerve ſends out propagations preſently after the diviſion to the muſcle that bends the head, called *Maſtoideus*, as alſo to that of the bone *hyoides*, called *ſternohyoideus*, and that of the *Larinx* or throtle, called *ſternothyroideus*; after this it enters the cavity of the cheſt, and when it comes to the axillary artery, iſſues forth from its inſide ſometimes three, ſometimes two ſurcles one under another which are returned about the ſaid axillary artery, as it were an axel-tree, or (to ſay trulyer) a kind of pulley, and cloſing together make one nerve; which being faſtned to the right ſide of the rough artery, by the benefit of a membrane, runs back from the lower part thereof to the higheſt, and haſts to the right ſide of the throtle, leaning upon a glandule, which is placed at the root of the right ſide. Having paſt this, it is forthwith divided into many ſurcles, which are ſpent upon the muſcles of their own ſide, which are placed in the throtle, and have their heads downward, giving motion to them. And this nerve is called *Recurrens*, the returning one from its progreſſe, and is very famous among all, being ſo made by skilfull nature with great wiſdome, that it might be inſerted into the muſcles of the throtle, whoſe heads look downward, when all the nerves that give motion, ought to be inſerted into the heads, and to look towards the end, not on the contrary. And becauſe the throtle is an organ of the voice, but the voice cannot be uttered without motion of the muſcles, that either open the cartilages of the throtle, or ſhut them; therefore theſe nerves, which impart to the muſcles the power of moving and contracting themſelves, being either bound hard or cut off, it happens for that cauſe, that the voice is taken away. This may be very handſomely ſhewn in dogs, or in a hog, becauſe the one continually makes a noiſe with barking, the other with grunting. For one of theſe nerves being cut off, halfe the voice is taken away; but both being cut, it is wholly loſt. The recurrent propagation being thus conſtituted, the outer branch running down obliquely under the hollow of the neck, after that by the way it hath diſtributed ſurcles of an indifferent bigneſſe into the *Pleura*, or membrane of the ribs, and into the coat of the lungs, and given others to the *pericardium* or purſe of the heart, and to the heart it ſelf; it deſcends farther within the duplication of the *mediaſtinum*, and near to the rack-bones is divided into two branches, which make *the right nerve of the left orifice of the ſtomach*, are carried obliquely, and then piercing through the midriffe, together with the gullet, to which for all that they afford never a branch, are conſumed upon the left orifice of the ſtomach, with many branches like a little net, and ſo encompaſſe it together with the left nerve, that it ſeems wholly to conſiſt of nerves. Hence there is ſo great a ſympathy of the ſtomach, not only with the brain, but with the heart alſo; that ſuch diſeaſes, as pain the upper orifice, ſeem to be of the heart, and indeed ſo they are, the ſame heart ſuffering pain, becauſe of this nerve being pained. And this is the true cauſe, to wit, the communion of this nerve, not the nearneſſe of both the entrails, as others ſay. The *inner branch* goes to the inner ſide of the root of the firſt rib of the cheſt, and cleaving to the

The propagations of the outer branch of the right nerve.

1.

2.

The right recurrent nerve.

3.

4.

5.

VVhence the ſympathy is betwixt the ſtomach and heart.

Propagations of the inner branch.

the rack-bones under the *Pleura*, runs down through the roots of the reſt of the ribs, taking to it a little branch from every one of the Intercoſtall nerves, that iſſue out of the back-bone, then paſſing through the midriffe with the Deſcendent trunk of the great artery it is carried as far as to the *os ſacrum* or great bone, at the region whereof it iſſues out three propagations, which are diſtributed into the naturall inner parts. *The firſt* goes to the lower membrane of the Kall, and deſcending through it is parted into three little branches, of which *one* is diſtributed to the right ſide of the ſame membrane, and to that part of the colick gut, that is joined unto it: *another* the leaſt of them, and a very ſmall one, to the guts *duodenum*, and the *jejunum* about its beginning; *the third* to the bottom of the ſtomach on the right ſide, and to the upper membrane of the Kall, which is ſomething the larger. That which remains of this propagation is ſpent upon the hollow part of the Liver, and the bladder of gall. *The ſecond* goes into the right kidney, and 2.
the membrane thereof. *The third*, which is greater then either of the former, deſcending to the firſt rack-bone of the loins, reaches into the right ſide of the meſentery and into the guts, that are tyed thereto, entring the center of the meſentery in company of an artery, and a veln. The remainder goes into the bladder, and in women into the right ſide of the bottom of the womb. But *the outer* branch of *the left* nerve, ſaving that in its deſcent it has offered ſprigs both to the *Pleura*, or membrane inveſting the ribs, and to the coat of the lungs, and that outwardly, as alſo to the purſe of the heart, and heart itſelf inwardly, at that part of the Deſcendent trunk of the great artery, where it firſt iſſues out of the heart, and is bowed to the back-bone, it ſends forth three ſurcles, which returning to the ſaid artery cloſe together into one nerve, which is called *ſiniſter recurrens nervus*, the left returning nerve, and in like manner as the right one, takes its progreſſe upward, and is propagated into the muſcles of the *Larinx*, or throttle. After this it iſſues out a ſmall ſprig, which is diſtributed through the *baſis* of the heart, and coat of it in manner of hairs. Afterward the remainder deſcends inclining itſelf obliquely to the right, and goes to the upper orifice of the ſtomach, into the right ſide whereof it is diffuſed, as the right branch was before into the left ſide, being divided into many little branches in manner of a net. From this a ſurcle is carried down along the upper part of the ſtomach to the *pylorus*, or lower orifice, which when it hath as it were interwoven with ſome ſprigs, it goes into the hollow of the liver. *The inner* branch firſt of all takes to it propagations from the intercoſtall nerves, and then paſſing through the midriffe is divided into three. *The firſt* of them goes overthwart to the Spleen, and in the way ſhoots out two ſprigs, *one*, which is likewiſe ſent into the lower membrane of the Kall, and part of the colick-gut, which is tyed thereto; *another* into the left ſide of the bottom of the ſtomach, and into the upper membrane of the Kall. *The ſecond* propagation goes into the left ſide of the Meſentery, and the guts of that place; ſometimes alſo it iſſues ſprigs, which run out with the ſeminary veſſels through the proceſſes of the *Peritoneum*, or rim of the belly to the teſticles. *The third* goes to the left Kidney, and the fat membrane thereof. The remainder of the branch paiſes to the left ſide of the bladder, and of the bottom of the womb. The uſe of this pair is manifeſt enough, as being very notorious, when the outer branch beſtows little boughs upon the middle bowels, but the inner upon all thoſe of the loweſt belly, and the right branch upon thoſe of the right ſide, the left on thoſe of the left. Beſides this uſe it conduces by the returning branches alſo to the framing of the voice, by imparting the faculty of motion to the muſcles of the throttle.

The outer branch of the left nerve.

Its propagations.

The left recurrent nerves.

Propagations of the inner branch of the left nerve.

1.

2.

3.

Uſe.

The ſeventh pair ariſes in the utmoſt part of the nowl-bone, where the marrow of the brain is ready to goe out of the skull, and ſo is counted the hardeſt of all the nerves, that have their originall within the skull. But it ariſes in ſome roots ſeparated from each other, which joining together on both ſides into one, it goes out of the skull through the fourth and fifth holes of the nowl-bone (which are placed betwixt that greateſt one, which opens a way for the deſcent of the ſpinall marrow, and that, at which the ſixth pair goes out) and preſently after its egreſſe is involved in one common membrane with the ſixth pair; whence ſome, not ſo diligently obſerving it, have beleeved that they were mixt one with another; and thus they deſcend together. When it comes to the root of the tongue, it diſtributes ſurcles into all the muſcles thereof, ſending over ſome alſo to certain muſcles of the bone *hyoides*, and of the throttle, as alſo to thoſe, which take their beginning from the *appendix* called *ſtyloides*. The uſe of this conjugation is to carry down the faculty of ſenſe, & motion from the brain, to the muſcles of the tongue.

The ſeventh pair. Its originall.

Its uſe.

To theſe ſeven pairs, which are commonly ſo numbred, we adde *an Eighth* which makes the nerves of ſmelling, by which a faculty is derived from the brain of apprehending the odours of things without. Theſe are commonly affirmed to ariſe out of the marrowy ſubſtance of the brain, in the *baſis* thereof, near to the firſt pair; but the new diſſection of the brain, and which is performed by turning it upſide down, hath taught us, that they ariſe at the utmoſt ſides of the brain, in that part, which is above the holes of the ears, whereby it is manifeſt, that hitherto only one half of them hath been ſhewn. They are very ſharp at their originall, and diſtant one from the other, but going forward by degrees

The eighth pair.

Its originall.

grees, betwixt the uppermoſt and middle prominence of the brain, they grow thicker, and draw nearer one to another, and ſo at length they lye down above the *ſinus* or cavities of the ſpongy bone within the skull. Theſe are thruſt into the mammillary proceſſes of the brain: but *Galen* and *Marinus*, (whom almoſt all Anatomiſts have followed) would not call them by the name of Nerves, although they altogether agree therewith in their colour, courſe, and uſe, becauſe they neither have productions like the reſt of the nerves, nor go out of the cavity of the skull: but truly they ſeem to me to commit no other a ſophiſm, then they, who have expelled the teeth out of the number of the bones becauſe they are not inveſted on the outſide with a membrane, as others are, although neither this makes any thing to the eſſence of the bones, nor that to the eſſence of the nerves.

CHAP. II.

Concerning the nerves of the Spinall marrow properly ſo called, and firſt of thoſe of the Rack-bones of the Neck.

NAture, the wiſe parent of all things, as ſhee hath framed the nerves, that they might ſerve for the carrying of the faculties, and ſpirits, that are generated in the brain, becauſe the brain itſelf could not be diffuſed through the whole body: ſo when the ſame could not conveniently beſtow nerves upon all the parts, by reaſon of their too great diſtance, ſhee made the ſpinall marrow, which is nothing elſe, but the marrow of the after-brain and brain, extended through the long conduit pipe of the rack-bones of the back. And therefore we having already viewed thoſe nerves, which take their originall from the marrow of the brain, whileſt it is yet contained in the skull; it remains now, that we take a view of them alſo, which come from the ſpondyls of the back-bone: But it is called marrow, not that it hath any affinity by reaſon of its ſubſtance with the marrow of the bones; but becauſe like marrow it is contained within the rack-bones; but the ſubſtance thereof is like that of the brain, which itſelf alſo *Plato* called marrow; and it is named the *ſpinall* marrow, or *of the back*, to diſtinguiſh it from both thoſe, that are not contained in the back-bone, but either in the skull, as the brain, or in the hollowneſſe of the bones, as that which is properly called marrow. This ſubſtance is covered with two membranes, no otherwiſe then the brain itſelf is, from whence it takes its originall, the one thick, the other thinner, which are inveſted with a certain third, ſtrong, and membranous covering, that *Galen* thought to be the ligament of the rack-bones. But it was made to that end, that it might diſtribute ſenſe, and motion to the muſcles, aad membranes, to which thoſe pairs of the brain do not reach. Therefore, when there is a good number of nerves ariſing there from, yet we ſhall eaſily reduce them to ſome certain *claſſes*, or companies, if we ſay that they all make up thirty pairs, of which ſeven belong to the marrow, whileſt it is carried through the rack-bones of the neck; twelve, whileſt it is carried through thoſe of the cheſt; five, through thoſe of the loins; and laſtly ſix to that, which is contained in the holes of the *os ſacrum*, or great bone. But theſe nerves go out through the holes of the rack-bones, and either *with a double originall* on the fore and hinder part, as it happens in the two firſt conjugations of the neck, and five of the great bone, which ariſe not from the ſides, that is, from the right, or left part, but iſſue forth two branches before and behind; or elſe *with a ſingle one*, through one hole bored in both ſides of the rack-bones, as happens in all the reſt of the pairs, in which one nerve iſſues from the right ſide, the other from the left. But the firſt, and ſecond pair have a double beginning, leſt if they ſhould ariſe with a ſingle one, that being ſomewhat thicker might have been hurt by the joints of the rack-bones; or if the hole ſhould be made larger, the rack-bone (which was ſmall enough of itſelf) ſhould be liable to breaking. Therefore that both theſe evils might be avoided, the wiſe Opificer made a double beginning, one on the forepart, another on the hinder. But the right branches go every where to the right ſide, the left to the left, and they are diſtributed on both ſides after the ſame manner.

The ſpinall marrow.

Why it is called marrow.

It is wrapt up in two membranes.

The conjugations or pairs of the ſpinall marrow.

The firſt pair of the neck.

The firſt pair therefore [*tab.* 1. *n.* 1.] ariſes *with its firſt, and foremoſt propagation* [*tab.* 1. B] from the forepart of the ſpinall marrow, and paſſes out betwixt the nowl-bone, and the firſt rack bone of the neck, near to the ſides of that round ligament, wherewith the tooth-like proceſſe of the ſecond rack-bone is tyed to the foreſide of the nowl-bone, and ſo it is diſtributed into the muſcles over the neck, and under the gullet, that bend the neck. *With the other, and hinder propagation*, [*tab.* 2. *Fig.* 1. *C.*] it likewiſe falls out through the hole, that is common to the nowl-bone, and firſt rack-bone of the neck, toward the hinder part, but with a double ſprig, one of which being ſmall is ſpent upon the leſſer ſtrait muſcles, and the upper oblique ones, that extend the head; the other reaches out into the beginning of the muſcle, which liſts up the ſhoulder-blade.

The

The second pair [*tab.* 1. 2.] *with its fore-branch* [*tab.* 1. D,] (which is slender, then the hinder one, though both of them seem small enough) ariling from the fore-part of the marrow goes forth betwixt the first, and second rack-bones at the side of the tooth-like processe, which branch is distributed into the muscles, that lie upon the neck, as well as the fore-branch of the first pair, which is wrapped together with it; and is almost wholly spent upon the skin of the face. *With its hinder branch* [*tab.* 2. *Fig.* 1. E.] it slips out through the sides of the backward processe of the second rack-bone, but presently is cleft into two branches of unequall bignesse, of which *that which is the thicker* [*tab.* 2. *fi.* 1. F.] tends from the forepart to the hinder, where the muscles seated on both sides of the hinder part of the neck do meet together, & there being mixt [*t.* 2. *f.* 1. G] with the third propagation of the third pair of the nerves, it runs out through the middle of the said muscles, returning from the hinder to the foreparts, and so is distributed into all the skin of the head, as far as to the top of the crown, [*t.* 2. *f.* 1. H] as also to the ears. *The other branch, which is the slenderer*, is inserted into the greater straight muscles, and the lower oblique ones, that extend the head. *Galen* makes mention of these branches *lib.* 4. *de locis affect.* which place we shall not think much to transcribe hither, it making very much to the illustration of the use of this kind of learning. Not long since, sayes he, they ulcerated the head of a certain man, by laying on medicins vehemently heating, thinking by this means his sense, that was greatly impaired, might be recovered. But we cured this very man, having found out the seat of the disease as well from other accidents, as from the primitive, or procatarctick causes. For we diligently examined him about every one of them, and found that this was one; when he had walked in much rain caused by a violent wind, his cloak was wet about his neck, so that he felt himself affected with a vehement cold in that part: so then if you know that four nerves ascend from the first racks of the back-bone to the head, from which the skin about it receives its sense, you will easily find out the seat of the disease, that therefore being healed, the skin of the head was healed also, as having no primary disease. The second pair.

The third pair [*tab.* 1. 3.] issues out of the common hole in the sides, which is betwixt the second and third rack-bones, and presently after it gets out, is cleft into two branches, of which the *more forward* one [*tab.* 1. I.] is subdivided into four propagations. *The first* [*t.* 2. K] goes to the first bending muscle of the neck, or the long one: *the second* [*t.* 1. L.] runs down, and being united with a sprig of the fourth pair [*tab.* 1. Q.] ends in the muscles, that lye under the gullet. *The third* [*tab.* 1. M.] climbs up, and joining with the thicker branch of the second pair but now mentioned [*tab.* 2. *f.* 1. F] is spent upon the skin of the hinder part of the head. *The fourth* [*tab.* 1. N] is imparted to the transverse muscles, or to the first pair of the extenders of the neck, and to that, which lifts up the shoulder-blade, of which two muscles that ends in the transverse processes of the neck, this begins therein; and at length it is digested into the square muscle, that draws down the cheeks, which is called by *Galen* πλατυσμαμυώδης. *The hinder branch* [*tab.* 2. *f.* 1. O] is implanted into the second pair of muscles, that extend the chest. The third pair. Its fore-branch. Its hinder branch.

The fourth pair [*tab.* 1. *numb.* 4.] issues out of the common hole of the third, and fourth rack-bones, and like the third pair is divided into two unequall branches. *The more forward and greater* [*tab.* 1. P] is cleft into three other twigs, of which *the first* [*tab.* 1. Q.] is joined with another branch of the third pair [*tab.* 1. L] and goes to the first long pair of muscles, that bend the neck. *Another* [*tab.* 1. R] goes to the transverse muscle, or first of those, which extend the neck, and to the first of the shoulder-blade, called *Cucullaris*, the cowl-muscle. *The third* [*tab.* 1. S] being smaller then the other, and joyned with a surcle of the fifth pair, and another branch of the sixth pair, near to the *mediastinum* or membrane that parts the chest in the middle, and above the *Pericardium*, passes on downward, that out of these three principles the nerve of the midriffe may be made up. *The hinder branch* [*tab.* 2. *f.* 1, T] goes toward the spine or ridge, under the muscles, which are placed thereabout, to which also it affords a good number of branches, and from thence being led downward between the muscles on both sides of the neck, it is carried to the square muscle, that draws down the cheeks. In this place it is worth our labour to inquire what may be the reason, that they who are troubled with a Resolution, or deprivation of motion in the whole body, have nevertheless the motion of their midriffe for a while free: some make answer, that this happens, because although no spirits are sent over from the brain, yet they may be diffused out of the marrow of the back. But these men beg the question, when we suppose, that no spirits come from hence, because we see that all the muscles of the whole body, to which nerves are sent from the marrow of the back, are resolved or deprived of motion. Therefore I thought fit to seek out for another answer, and to say that the midriffe has two motions, one, that is voluntary, which we use, whilst we breath strongly; another naturall one, when the fibres are extended, and contracted of themselves. A man therefore is preserved by this naturall motion, when we see that breathing is little, and weak, and as much as suffices, that the lungs may be moved a little. The fourth pair. The fore-branch. Its propagations. 1. 2. 3. The hinder branch. A question.

The fifth pair [*tab.* 1. *numb.* 5] goes out betwixt the fourth and fifth rack-bones, and, like the two last fore-going, is cleft into two branches. *The forwarder* of them [*tab.* 1. U] issues forth The fifth nerve. Its fore-branch.

forth some propagations. *The first* [*tab.*1. betwixt U and 6] goes to the muscles, that bend the neck. *Another* [*tab.*1. X] together with propagations of the fourth, and sixth pairs, sometimes also of the seventh, to wit, then when the branch of the fourth is wanting, descends near to the side of the gullet through the forepart of the rack-bones of the neck, and is implanted into the midriffe, & so makes the midriffe nerve. *The third* [*t.*1 Y] is carried through the upper part, and outside of the arm, to the second muscle of the arm, to wit, that which lifts it up, called *Deltoides*, from whence little branches are sent over to the first, and second, that is to the cowl-muscle, & the lifter up of the shoulder-blade. *The fourth* propagation [*tab.* 1. b] at the neck of the shoulder-blade is cleft into two, of which *the former* [*tab.*1. c] goes into the muscle *Deltoides*, at that part where it arises from the clavicles or canal-bone: *the latter* and thicker [*tab.*1. d] is inserted into the fourth pair of muscles of the bone *hyoides*, called *coracohyoideum*, and from thence imparts a small branch to the upper muscle over the shoulder-blade called *superscapularis*, and to the muscle *Deltoides*, where it arises from the spine of the shoulder-blade.

The hinder branch.

The hinder branch [*tab.*2. *f.*1. e] is writhen toward the back-bone, and distributed in the same manner, as the hinder branch of the fourth pair is.

The sixth pair.

The sixth pair [*tab.*1. *numb.*6] goes out under the fifth rack-bone, and in like manner as the other pairs are, is divided into two branches. *The forwarder and greater* [*tab.*1. f] after it has propagated that sprig, [*tab.*1. g] which we said is joined with the fourth, and fifth pair, [*tab.*1. S and X] to the making up of the nerve of the midriffe [*tab.*1. i] passing on farther is united with the two next following pairs, the seventh of the neck, and the first of the chest, and is again separated from them, and then again being joined with them it so weaves a certain net-like texture, from which nerves are issued forth, that go to the arm.

Its fore-branch.

Its hinder branch.

The hinder [*tab.*2. *fig.*1. l] is carried to the hind muscles, which extend the head, and neck.

The seventh pair.

The seventh pair [*tab.*1. *n.* 7] is derived from the marrow of the neck, and issues forth through the common hole of the sixth, and seventh rack-bones.

The fore-branch.

The forwarder, and greater branch thereof [*tab.*1. m] is joined presently after its egresse with the sixth nerve of the neck, and the first of the chest, and for the greater part is carried with the rest to the arm.

The hinder.

The hinder and lesser branch [*tab.*2. *fig.*1. n] goes to the muscles, that lye upon the neck, and to the square one, that draws down the cheeks.

CHAP. III.

Concerning the Nerves of the marrow of the rack-bones of the Chest.

TWelve conjugations of nerves issue forth from the spinall marrow, whilst it runs through the rack-bones of the back, as the most learned *Vesalius* has rightly opinioned, however there are but eleven holes bored in the twelve rack-bones thereof, as *Columbus* objected, because the first pair passes out between the last rack-bone of the neck, and the first of the back, wherefore it ought to be numbred rather among the pairs of the chest, then those of the neck. All these conjugations after their egresse are divided in two; and the one branch which is the greater, alwayes bends forward; the other which is the lesse is bent to the hinder parts, and to the muscles, that lye upon the back.

The first Pair.

The first pair then [*tab.* 1. *numb.* 8] of the nerves, which issue forth from the marrow of the chest, goes out of the common hole of the seventh rack-bone of the neck, and the first of the chest, in the same manner, as the five pairs last mentioned do,

Its fore-branch

and in like sort also is forthwith divided into two branches. The *forwarder*, and greater [*tab.* 1. o] is united, [*tab.* 1. p] partly with the seventh nerve of the neck, partly with the second of the chest, in that manner, which we have before explained; and so afterward is wholly consumed upon the arms, excepting one propagation [*tab.* 1. q] which arising at the beginning of it, is joined with the said nerves, and runs into the foreparts, near the length of the first rib of the chest, to the breast bone, bestowing a sprig upon the subclavian muscle, after that being reflected upward it is spent upon the muscles, which take their originall from the top of the brest-bone: such are the muscle, that bends the head called *Mastoideus*, that which draws down the bone *hyoides*, or *sternohyoideus*; and the first of them which extend the buckler-like gristle of the throttle, called *thyroides*, or the muscle *sternothyroideus*. But to the two last sometimes branches are sent over from the sixt conjugation of the brain, and the third of the chest. The same branch also when it has past the arm-pit, being ready to go to the arm, issues forth a certain other propagation from its hinder part, which goes to the muscles seated in the hollowness of the shoulder-blade.

Its hinder branch.

The hinder and lesse branch [*ta.* 2. *fig.* 1. r] lies hid under the muscles, which grow to the rack-bones, and imparts some propagations to the second bending muscle of the neck, and to them which extend the head and neck; but when it has attained to the spine of the seventh rack-bone, it goes overthwart to the lower side, and distributes surcles into the first muscle of the shoulder-blade, or that like a Monk's cowl, and into the third of the same, called *Rhomboides*, as also into the upper of the hindmost saw-muscles.

The

The ſecond pair [*ta.* 1. *num.* 9.] breaks out betwixt the firſt and ſecond rack-bones of the cheſt, and is cleft likewiſe into two branches. *The forwarder* [*t.* 1. s.] is united with the firſt pair of the cheſt; and thus the firſt and ſecond pairs of the cheſt are united by turns, with the fifth, ſixth, and ſeventh of the neck, that the one are not diſcerned from the other; but make a net not unlike to thoſe ſtrings which hang at Cardinals hats; from which afterward all the nerves that go to the arms, iſſue forth, and take their originall. This ſpreads out a branch [*t.* 1. t] which goes forward through the firſt diſtance betwixt the ribs, according to the courſe of the firſt rib, as far as to the breaſt-bone, making the firſt Intercoſtall nerve, from which ſurcles [*t* 1. u] are diſtributed into the muſcles that lie upon the cheſt. *The hinder* branch [*t.* 2. *f.* 1. x] has the ſame diſſemination with that of the foregoing pair. The ſecond pair. The fore-branch. The hinder one.

The other ten pairs [*tab.* 1. *numb.* 10, 11, 12. and ſo on to 19 incluſively] of the nerves of the cheſt, obſerve the ſame manner both of their riſe, and diſtribution. For they all iſſue out of the common holes of the rack-bones at the ſides, and preſently after their egreſſe are cleft into two branches of unequal bigneſſe, one of which is the forwarder and greater; the other, the inner and leſſe. *The forward* branches [*ta.* 1. *y.*] (which make the nerves between the ribs) are carried into the fore-ſide, and each of them affords a little branch in order according to its length, to the inner branch of the ſixth pair, which deſcends under the *pleura* to the roots of the ribs. Theſe branches are joined with the Intercoſtall veins and arteries; together with which they paſſe along the rib to the forepart through the *ſinus* or chanel, which is cut out on the lower and inſide of the ribs. But they which belong to the true ribs, go on as far as to the breaſt-bone; but they which belong to the baſtard ones, are carried into the forepart of the *abdomen* above the *peritonæum* or rim of the belly. From theſe nerves many branches are diſſeminated into the muſcles between the ribs, not only in the inner, but the outer ones alſo, as wel as into the other, [*ta.* 1. *x*] which lye upon the cheſt; ſuch as are the fourth, and fifth muſcles of the ſhoulder-blade or the two formoſt ſaw-muſcles, as alſo the broad one, called *Latiſſimus* [*tab.* 1. *β*] that moves the arm backward from the breaſt. In like manner a propagation goes from the fifth Intercoſtall nerve, about the middle of the rib, paſſing through the Intercoſtall muſcle, into the firſt pair of the muſcles of the *abdomen*, [*ta.* 1. *a*] as alſo into the skin of the cheſt; and being divided in four parts is diſtributed into the pectorall muſcle that moves the arm forward to the breaſt, and alſo into the skin, from which ſome ſprigs doe afterward goe to the nipples of the breaſt [*ta.* 1. *γ*] and impart to them a very ſharp ſenſe. *The hinder branches* [*ta.* 2. *fi.* 1. *δ*] goe backward to the ſpine, or ridge, between the muſcles going to the rack-bones, which have the charge of extending the cheſt. Yet are they not wholly ſpent upon theſe muſcles, but when they have now attained to the tops of the ſpines, they fall out between the muſcles of both ſides, whereabout they are joined to one another, and ſo afterward they give nerves to all the muſcles, which ariſe out of the tops of the ſpines of the rack-bones. Such are the firſt extending muſcle of the head, called *Triangularis*, or *Spleneus*; the third muſcle of the ſhoulder-blade, or *Rhomboides*; the firſt of the ſhoulder-blade, or *Cucullaris*; the third broad muſcle that leads the arm away from the breaſt, called *Aniſcalptor*, and the hinder ſaw-muſcle. A good number alſo of ſurcles are diſtributed into the skin of the back. Their fore-branches. Their hinder branches.

CHAP. IV.

Concerning the nerves of the marrow of the rack-bones of the loins.

FRom the ſpinall marrow, whilſt it is carried through the loins, although there be only four holes, yet five pairs iſſue forth, the firſt being between the laſt rack-bone of the cheſt, and the firſt loins. But they go forth through the common holes, and being gone forth, are diſtributed in like manner as we have ſaid of the nerves of the cheſt; when from every one of them, preſently after its gong out, one branch, and that the greater, ſpreads it ſelfe forward; the other, and leſſe backward. *The formoſt* branches run to the muſcles of the *abdomen*, or outer, and forepart of the loweſt belly; the *hindmoſt* to them, which lie upon the ſpines of the rack-bones, and the bones without a name, from whence they impart ſome little branches alſo to the skin that covers the loyns. But the fore-branches are knit together, the firſt with the ſecond, the ſecond with the third, the third with the fourth, and the fourth with the fifth in the ſame faſhion, as we ſaid the nerves of the arm were, whilſt they make the net-like complication.

The firſt pair then, [*ta. num.* 1. 20.] as the reſt do alſo; going out under the *peritonæum*, or rim of the belly, through the common hole of the rack-bones, which is betwixt the laſt rack-bone of the cheſt, and the firſt of the loins; preſently after its egreſſe is cleft into two branches. *The fore-branch*, which is greater, goes into the fleſhy parts of the midriffe, and into the beginning of the firſt bending muſcle of the thigh, called *Ψoas*. The firſt paire. Its fore-branch

From this nerve a certain furcle [*ta.* 1. 39.] takes its beginning, reaching out for the most part with the preparing artery to the testicle. *The hinder branch* [*ta.* 2. *fig.* 1. *nu.* 42.] sends propagations into the muscles that lie upon the backside of the rack-bones of the loins, such as are the first and third of them which extend the chest, that being called *Dorsi longissimus*, this *sacrolumbus*; as also the muscle which extend the loins: but when they issue out from the tops of the spines, wherabout the said muscles are joined one to another, they run to the sides, and are implanted into the broad muscle, that leads the arm outward from the breast, called *Latissimus*.

The hinder one.

The second. *The second pair* [*t.* 1. *n.* 21.] goes out under the first bending muscle of the thigh, called *Psoas*, betwixt the first and second rack-bones of the loins. *The fore-branch* thereof is distributed to the second bending muscle of the thigh, that fills up the cavity of *os Ilium*, or the hanch-bone, and the first bending one of the leg, called *Fascialis*, as also to the skin of the thigh. *The hinder branch* going out of the *abdomen* is distributed to the three muscles that extend the thigh, or the *Glutæi*; and to that which extends the leg, called *Membranosus*, the membranous muscle.

The third. *The third pair* [*t.* 1. *n.* 22.] issues forth likewise under the first bending muscle of the thigh, betwixt the second and third rack-bones. *The fore-branch* thereof passes over near to the hanch-bones, distributing two propagations; *one* which goes to the knee, and its skin; *another* [*t.* 1. 51.] which accompanies the vein of the inner ancle, called *saphena*. *The hinder branch* is reflected and disseminated into the muscles which lie upon the loins.

The fourth. *The fourth pair* [*t.* 1. *n.* 23.] is the greatest of all the nerves of the loins, and being carried under the said muscle that bends the thigh, as also under the *os pubis*, or share-bone, accompanies the Crurall vein and artery.

The fifth. *The fifth* and last pair [*t.* 1. *n.* 24.] issues out betwixt the fourth and fifth rack-bones; *the fore-branch* whereof passes through the hole which is betwixt the hip-bone, the *os pubis*, or share-bone, and the *os Ilium* or hanch-bone, and distributes some propagations to the two muscles that turn the thigh about, called *Obturatores*, others to the second and third bending ones of the thigh, and others to the muscles of the yard. *The hinder branch* goes into the muscles, and skin upon the rack-bones.

CHAP. V.

Concerning the nerves of the marrow of os sacrum *or the great bone.*

The first paire. LAst of all from the marrow which is contained in the rack-bones of the *os sacrum*, the six last pairs of the nerves of the spinall marrow do issue forth. *The first* of these [*t.* 1. *n.* 25.] goes out betwixt the last rack-bone of the loins, and the first of the great or holy bone, in the very same manner as the rest, that arise out of the rack-bones of the loins, and likewise after the same sort is divided into two branches. *The fore-branch* although it be mixed with the crurall nerves, sends yet a furcle [*t.* 1. 43.] over near to the inner region of *os Ilium*, and is dispersed into the muscles of the *abdomen*, and into the second bending one of the thigh. *The hinder* [*t.* 2. *f.* 1. *n.* 44.] is disseminated into the muscles that arise from the *os Ilium* or hanch-bone, and especially into the first of them, that extend the thigh, or the greater *Glutæus*, as also into the skin of the buttocks.

The other five pairs. *The other five pairs* have something proper to themselves; so that before they go out of the bone, they are every of them double on each side, and so from every one of them a double branch is carried on each side, one to the forepart, another to the hinder. The three uppermost of the fore-branches, as that of the first pair also, go to the *Crus*, or parts of the body below the buttocks: the two lowest go into the muscles of the fundament and bladder; and in women to the neck of the womb, in men to the yard; but in both sexes to the outer privy parts. The hinder branches are distributed to the muscles seated on the backside of the bones *Ilium*, and *sacrum*. Of this sort are the first and third extending muscles of the chest, or *Dorsi longissimus*, the long muscle of the back, and *sacrolumbus*, that which bends the loins, called *sacer*, and the broad muscle that leads the arm away from the breast; as also the three which extend the thigh, being the authors of the buttocks, and therefore called *glutæi* the buttock-muscles. And this is the utmost end of the spinall marrow, which reaching into the rump-bone, called *os coccygis* is in this manner terminated: And this is the history of the thirty pairs of the nerves which go out of the spinall marrow, which is diligently and accurately to be committed to the memory, that we may know to what place remedies ought to be applyed, if at any time from some externall cause, as by a fall from aloft, or a bruise, or some notable compression, any part shall have lost either motion, or sense, or both. For the remedies must be applyed alwaies to the beginning of that nerve, not to the place, in which the symptome is perceived.

CHAP.

CHAP. VI.

Concerning the Nerves which are diſtributed through the Arms.

THoſe nerves being now enumerated, which are diſperſed through the muſcles of the three bellyes, and the parts contained in them; it remains that we deſcribe thoſe alſo, which are propagated through the *artus*, or extream parts of the body. Here we meet with them firſt, which are diſtributed through the arms, whereof there are ſix pairs commonly ſet down by Anatomiſts ariſing from the fifth, ſixth, and ſeventh pair of the nerves, that come out of the marrow of the neck, and from the firſt, and ſecond of thoſe, which iſſue out of the cheſt. Theſe nerves go out through the common holes of the rack-bones, on both ſides, and preſently after their going out are united one among another with their forwarder, and greater branches, by and by are ſeparated one from another again, and joined again, and finally ſeparated, ſo that they ſeem to make out a certain net-like texture, which cannot be better likened then to thoſe ſtrings of Cardinals hats. This implication of nerves goes forth under the clavicle, or coller-bone, about that place, where the axillary veins and arteries go out of the hollow of the cheſt, and from this all the nerves of the arm take their originall. But their riſe is very uncertain by reaſon of their being ſo knit together, wherefore wee in our relation of them will rather follow the footſteps of other men, then our own obſervations, leſt wee ſhould ſeem to affect new opinions raſhly, and without neceſſity.

The firſt nerve then [*tab.* 1. e] which is carried to the arm, is a double propagation, namely the third, and fourth of the fore branch of the fifth pair of the neck. For *the one* branch [*tab.* 1. Y] is carried to the ſecond muſcle of the upper part of the arm called *Deltoides*, and to the skin that lies upon it: *the other* [*tab.* 1. b] goes toward the neck of the ſhoulder-blade, where it is cleft into two branches; *the former* of which [*tab.* 1. c] goes into the muſcle *Deltoides*, where it ariſes from the collar-bone; *the latter* [*tab.* 1. d] is inſerted into the fourth pair of the muſcles of the bone *hyoides* called *coracohyoideum*, and from thence affords a little branch to the upper ſuperſcapular muſcle, and the *Deltoides*, at what place it ariſes from the ſpine of the ſhoulder-blade. *This* nerve runs out through the higher ſide of the arm; but *the other five* are carried through the arm-pit into the arm, and in the ſame are ſcattered into more branches. The firſt nerve of the arm.

The ſecond nerve [*tab.* 1. ζ] is thicker, and takes it originall from that net-like compliſcation, of which we ſpake, yet, from what nerve cannot be evident enough. This is carried down through the middle, and fore-part of the arm; into which it enters under the firſt bender of the cubit, or the double-headed muſcle, at that part, where its two heads are united one with the other, and where the tendons are inſerted both of the pectorall muſcle, that leads the arm forward to the breaſt, and of the *Deltoides*, that lifts it up. Being hid then under this muſcle it ſends forth two propagations [*tab.* 1. *u*] one of each ſide, which enters into the two heads of the muſcle *biceps*; and after that about the middle of the length of the upper part of the arm, going under the ſame double-headed muſcle, it ſhoots forth another ſprig [*tab.* 1. †] by means whereof it is joined with the third nerve; and from thence deſcending it diſtributes in its progreſſe a ſurcle [*tab.* 1. §] from its outſide to the head of the longer of the two muſcles of the *radius* or wand, that turns the palm of the hand downward. When it is now come to the bending of the cubit, being led to the fleſhy membrane, near to the outſide of the tendon of the ſaid double-headed muſcle, it is diſtributed into the skin, being divided into two branches, of which one is the outer, the other the inner; that is the ſlenderer, this the thicker. *The outer* then [*tab.* 1. *ι*] being carried down a good way with a branch of the Cephalick vein through the inſide of the cubit, is diſtributed [*tab.* 1. λ] to the ſecond bone of the thumb. *The inner* branch [*tab.* 1. *κ*] is ſubdivided under the common vein of the arm, or the middle one, called *Mediana*, into two branches, *the outer* whereof [*tab.* 1.] going on obliquely under the skin leaving the vein goes away toward the *radius* as far as to the wreſt: but *the inner* [*tab.* 1. *ν*] being faſtened to the inner branch of the Cephalick-vein, when it goes more obliquely, in the region of the cubit is cleft into two ſpeciall branches, of which *one* [*tab.* 1 *π*] is diſtributed through the region of the leſſer bone of the cubit, *the other* [*tab.* 1. *ο*] through the region of the greater bone to the wriſt, and from thence, that being paſt, into the skin of the inſide of the hand. The ſecond. Its progreſſe. Its propagations. Its branches. The outer. The inner.

The third nerve of the arm [*tab.* 1. *ρ*] or the third, which is carried to the arm, lies next under the ſecond, and in like manner with it ariſes from that net-like texture. This nerve, whilſt it paſſes through the arm-pit, before it has yet attained to the arm, brings The third.

forth a propagation, [*tab.* 1, ♂] which is diſperſed under the skin betwixt the Pectorall muſcle, that leads the arm to the breaſt, and the muſcle *Deltoides*, that lifts up the ſame. But when it hath firſt attained to the arm, it hides itſelf under the muſcle *Biceps*, or firſt bender of the cubit, and paſſing on downward together with the ſecond nerve, it ſends out a littlebranch [*tab.* 1. ♃] into the head of the ſecond bending muſcle of the cubit. After this deſcending it receives a branch [*tab.* 1. ☿] from the ſecond nerve, by means whereof they are joined one with the other; and then it goes farther through the forepart of the arm unto the bending of the cubit, being alwayes equally diſtant from the ſecond nerve, and is carried into the protuberation of the inſide of the arm, and the fore-part thereof. When it hath paſt this, it iſſues forth many propagations, [*tab.* 1. ☽] which together with the branches, that are derived from the fifth nerve, which is carried through the hinder region of the ſame protuberation, are diſtributed into the muſcles, that are ſeated on the inſide of the cubit, and ariſe from the inner protuberation of the arm: ſuch are the two, that bend the uttermoſt bones of the fore-fingers, and that, which bends the third joint of the thumb. After this it ſends out another propagation, which is carried down between the ſaid muſcles through the *radius* together with a vein, and artery, to the wriſt, and paſſing through under the the tranſverſe ligament, ſcatters ſome ſmall ſprigs into the muſcle, that moves the thumb outward from the fingers, and the two, that bend the firſt joint of the ſame. After this when it is come to the palm of the hand, it is divided [*tab.* 1. ♈] into three branches; the firſt of which ſcatters two twigs into the thumb, the ſecond as many into the fore-finger, the third ſends one to the middle finger on the inſide.

The fourth. *The fourth nerve* [*tab.* 2. *fig.* 1. ♄] is the biggeſt of all them, which are carried to the arm, as being almoſt thrice thicker then the reſt. This ariſes, as well as the other, from the net-like complication, and from thence is carried down through the arm, in like manner as the third is, lying deep every where among the muſcles, having the baſilick-vein, and axillary artery for its companions. But preſently after it hath entred the arm, it derives many, but ſmall ſprigs [*tab.* 2. *fig.* ω] into the heads of the muſcles, that extend the cubit; and before it is come to half the length of the upper part of the arm, it is contorted obliquely downward to the bone thereof, and paſſes on betwixt that, and the muſcles, which extend the cubit. But before it be wholly reflected, it ſends forth a ſurcle [*tab.* 2. *fig.* 1. Γ] from its inſide, which goes betwixt the ſaid muſcles, as alſo the ſecond of them, that bend the cubit, and is ſpent upon the skin, that clothes the inſide of the arm, ſome fibres being propagated upward, and downward. Having diſſeminated this propagation it goes by degrees through the hinder part to the outſide of the arm, being carried through the cavity of the outer protuberation of the upper bone of the arm, that is cut out in the back-ſide thereof, where likewiſe it ſends out a ſurcle, [*tab.* 2. *fig.* 1. Δ] going to the skin, that covers the lower part of the outſide of the arm; and then another [*tab.* 2. *fig.* 1 Θ] which is diſtributed into the skin, as far as to the wriſt. After that near to the joint of the cubit it is divided into two branches, an outer, and an inner one, which being hid deep, and among the muſcles, as the whole trunk alſo, deſcend to the wriſt. *The outer branch* [*tab.* 2. *fig.* 1. Λ] goes along the *radius*, or wand, and when it is come to the wriſt, paſſes through the tranſverſe ligament, on the outer part, and by and by is ſubdivided [*tab.* 2. *fig.* 1. Ξ] into two branches, of which *one* goes with a double ſprig into the outſide of the thumb, the *other* is ſpent partly upon the fore-finger, partly on the middle one. But *the inner branch* [*t* 2. *fi.* 1. Π] reaching along the cubit ſcatters more propagations, the *firſt* [*tab.* 2. *fig.* 1. Σ] into the firſt muſcle that extends the fingers, the *ſecond* [*ta.* 2. *fig.* 1. Φ] into the ſecond, that extends the fingers; the *third* [*t.* 2. *fi.* 1. Ψ] into the inner muſcle, that extends the wriſt. But in its progreſſe [*t.* 2. *fi.* 1. Ω] it affords propagations to the three beginnings of the muſcles, that take their original from the *ulna*, or greater bone of the cubit. The remainder of it ends in the wriſt, [*tab.* 2. *fig.* 1. 31].

Its propagations.

In two branches.

The outer.

The inner.

The fifth nerve *The fifth nerve* [*tab.* 1. *numb.* 32] ariſing lower then any of the fore-mentioned, out of ſame net-like complication, and being joined to the fourth, deſcends through the inſide of the arm, between the muſcles, that bend, and extend the cubit. This ſcatters no propagation from itſelf, but remains intire, till it be come to the inner protuberation of the arm, at whoſe hinder cavity it is reflected, and is diſtributed afterward in the ſame manner with the third nerve, which paſſes through the foreſide of the ſame protuberation. For both of them beſtow propagations [*tab.* 1. 33] upon the muſcles, which grow out of the inner protuberation of the arm, and keep the inſide of the cubit. It iſſues forth a propagation alſo [*tab.* 1. 34.] which being carried through the *radius*, or wand; goes between the muſcles, which bend the ſecond, and third joints of the fingers, and ſo to the palm of the hand, & ſends out *the firſt branch*, which being parted in two is implanted into the inſide of the little finger; then *another*, which being alſo cut in two goes into the ring-finger, and at laſt *another* that goes to the outer part of the inſide of the middle finger. But from this ſame fifth nerve, and from the outſide near to the middle of the length of the *radius*, or wand, there grows out a certain other ſurcle, [*t.* 1. 35.] which being divided into three branches is diſſeminated into the outer part of the middle, the ring-finger, and the little one.

The

The ſixth nerve [*tab.* 1. *numb.* 36.] iſſues out of the loweſt part of the net-like complication, and going through the arm-pit, and inſide of the upper part of the arm, & of the cubit, under the skin it makes haſt to the inner protuberation of the upper-bone of the arm, diſperſing many ſurcles in its way to the neighbouring skin. [*t.* 1. 37. 37.] But as ſoon as it has attained to this protuberation, it is cleft into many propagations, ſome of which lie under the branches of the baſilick vein, ſome lie over, and ſo being carried under the skin, when they are come down to the wriſt, they end [*ta.* 1. 38.] The ſixth.

CHAP. VIII.

Of the nerves that are diſtributed through the Crura, *or thighs, legs, and feet.*

THere are four pairs of nerves, which are propagated through the *Crura*. They ariſe from the three lower conjugations of the loins, and the four upper ones of the *Os ſacrum*, or great bone, which after they are gone through forth the common holes of the rack-bones, as wel as the nerves, which are diſtributed through the arm, make a certain complication like the meiſhing of a net, but far greater then that other. Nor are theſe nerves of equall bigneſs, but the firſt [*ta.* 1. *n.* 46.] and the third [*ta.* 1. 56.] are ſmall, wherefore alſo they reach but to the thigh; the ſecond [*t.* 1. 50.] is ſomewhat thicker, and reaches to the leg; but the fourth [*t.* 1. 61.] alone is thicker then the three other put together; and is carried down as far as to the utmoſt ends of the toes.

The firſt nerve then [*ta.* 1. 46.] growes out of the higher part of the net-like complication, where the third nerve of the loins is joined with the fourth [*ta.* 1. 47. But it is preſently carried downward under the rim of the belly, to the thigh; lying upon the outſide of the tendon of the firſt bending muſcle of the thigh, to which when it is come, it ſends out a propagation [*ta.* 1. 48.] which runs out through the skin on the forepart of the thigh, as far as to the joint of the knee, and there ends, and offers ſurcles [*ta.* 1. 49.] to the firſt bending muſcle of the leg, as alſo to the ſecond and third, that extend the ſame. The firſt nerve.

The ſecond nerve [*t.* 1. 50.] ariſes out of the ſame complication, and below the firſt, over againſt the connexion of the third and fourth rack-bones of the loins. This together with the crurall vein, and artery, (which are the outer Iliacall branches) deſcends through the groin into the thigh, which when it has attained to, preſently it iſſues forth a notable propagation [*ta.* 1. 51.] from its inſide, lying upon the *ſaphena* or vein of the inner ankle, on the forepart, all the way it goes under the skin through the inner parts of the *crus* to the great toe. But as the vein *ſaphena* it ſelf diſtributes ſome ſprigs in the way to the skin next to it, ſo alſo this nerve ſends out many propagations, of which that is the chief [*t.* 1. 53.] which it gives to the foreſide of the knee. But the trunk it ſelf [*t.* 1. 54.] when it has ſent out this propagation, paſſes together with the trunk of the crurall vein and artery into the thigh, and is ſcattered into the muſcles ſeated on the inſide of the thigh, eſpecially [*t.* 1. 55.] into the third bending one of the thigh, and the fourth extending one of the leg, and ſo afterward it is terminated above the knee. The ſecond. The progreſſe of the trunk.

The third [*t.* 1. *n.* 56.] grows out of the complication, under the ſecond, over againſt the conjunction of the fourth and fifth rack-bones of the loins. This nerve being carried down upon the ſecond bending muſcle of the thigh, called *Iliacus internus*, paſſes through the hole of the ſhare-bone, and affords propagations [*t.* 1, 57.] to the two muſcles, that turn the thigh about, which they cal *Obturatores*, the ſtoppers, to wit, of that ſaid hole, as alſo to the two muſcles that erect the yard, which ariſe out of the bone of the hip. From thence like the two foregoing nerves, it deſcends, and diſtributes little nerves into the skin, that clothes the inner part of the thigh [*t.* 1. 58.] The remaining part [*t.* 1. 57.] lies deep, the chief propagation whereof [*t.* 1. 60.] is ſpent partly on the ſecond, partly on the third muſcle that bend the leg. The third.

The fourth nerve [*t.* 1. *n.* 61.] is made up out of the fore-branches of the four upper pairs of the great bone being united together. By reaſon whereof it paſſes the reſt, yea and all the nerves of the whole body, not only in thickneſſe, but in hardneſſe alſo, as being made of the laſt, that iſſue out of the ſpine, or ridge. This enters into the hinder part of the thigh through the cavity, that is in the hinder part of the hip-bone. But preſently it ſends forth a notable propagation [*t.* 1. 62.] from its back-ſide, which ſtayes a pretty while under the firſt extending muſcle of the thigh, or *Glutæus magnus*, the great buttock-muſcle, and from thence is diſperſed into the skin that covers the buttocks, and the back-ſide of the thigh to the middle of its length. Then it ſends other propagations [*ta.* 1. 63.] on both ſides, three for the moſt part to the heads of the third, fourth, and fifth muſcles that extend the leg, and to the third bending one of the thigh. After this the trunk of the nerve deſcends among the muſcles ſeated on the hinder part of the thigh, near to the bone, as far as half the length thereof, and diſtributes another branch [*t.* 1. 64.] to that fleſhy lump of the fifth bending muſcle of the leg, called *Biceps*, which growes to it on the inſide, The fourth. The progreſſe of the trunk.

inside, after it has gone beyond the middle of the thigh. From hence also other sureles proceed, which are distributed into the skin on the backside of the thigh. But the trunk it self proceeding farther on, at length attains to the knee betwixt the two heads of the bone of the thigh, and imparts a small branch [*t.* 1. 65.] on each side into the first extending muscle of the foot, and the sole muscle, called *plantaris*, and by and by is divided, [*t.* 1. 66.] into the inner cavity of the knee, or in the ham into two unequall branches, which are distributed alone through the leg and foot. For there is not any nerve which runs out through the leg, besides these two branches of the fourth; if you except only that notable propagation, which being derived from the second nerve, as we have said, descends in company of the vein *saphena*, through the inner part of the *crus*. *The outer* branch [*t.* 1.67.] is the smaller, and goes toward that part where the upper *appendix* of the *fibula*, or lesser bone of the leg is joined with the *tibia*, or greater bone thereof, scattering a propagation [*t.* 1.68.] in the way, which goes to the outer ancle under the skin, distributing in the mean time, many sprigs to the skin. But the branch it self [*t.* 1. 69.] passes between the muscles seated on the foreside of the leg, and going through the long ligament of the *tibia* and *fibula*, or two bones of the leg, passes together with the tendons of the muscles that extend the toes, under the transverse ligament, and dispersés little branches to the sides of the upper part of the toes. *The inner* branch [*t.* 1. 72.] is carried down through the backside of the *crus*, lurking betwixt the muscle of the sole of the foot, and the first of them, that move the foot obliquely, as also the long bending muscles of the toes; and being joined afterward with the branch of the outer, which passes through the ligament, it goes to the sole of the foot, and distributes propagations in both the sides of the lower part of the toes.

Its division.

FINIS.

AN

An Explanation of the two Tables of the Nerves.

THe thirty pairs of the nerves of the marrow of the brain, whilst it is carried through the spine or ridge, are expresst in these two Tables the present & the following one. Wee have inscribed common characters on both of them; though many also bee peculiar to one; after which we have presently set the number of the Table. But the first shews the rack-bones of the spine and the nerves that issue from thence on the foreside; the second on the backside.

nn. 1. 1. &c. — *as far as to* 7. *The seven rack-bones of the neck.*
8 *as far as* — *to* 19. *The twelve rack-bones of the chest.*
20 *as far as* — *to* 24. *The five rack-bones of the loins.*
25 *as far as* — *to* 30. *The six bones of the* os sacrum. *These same figures do stand for the pairs of the spinall marrow.*

A 1a. 1. & 2. — *The seat of the spinall marrow, where it first enters into the rack-bones.*

1. 1. B 1. C 2. — The first pair *of the neck, whose* forwarder *propagations is* B; *the* hinder C.

2. 1. D. E 2. E 2. F 2. — The second pair, *whose* fore-propagation *is* D, *its hinder* E, *from this two branches grow out; the* slender *one marked with the letter* E, the other thick *one with* F, *which is mixed with a branch of the third pair* M, *about* G. *But the course thereof to the skin of the crown, and backside of the head is marked with the letter* H.

G

H

3. 1. I. 1. K. 1. M. 1. — The third pair *of the neck, whose* fore-branch I *is divided into four propagations.* The first K *is implanted into the muscles, that bend the neck.* The second L *is mixt with a twig of the fourth pair* Q. The third M *is mixt with the thicker propagation of the hinder branch of the second pair* F. The fourth N *is inserted into the muscles that are joined to the transverse processes of the rack-bones.*

N.

O 2. — *The* hinder branch O.

4. 1. P. Q 1. R 1. S 1. T 2. 5. 1. V 1. — The fourth pair *of the neck, whose* fore-branch P *is cleft into three propagations.* The first Q *joins with the second propagation of the third pair* L. The second R *goes into the transverse muscle of the neck.* The third S. *The* hinder branch T.

The fifth pair *of the neck, whose fore-branch* V *issues out some surcles.* The first *goes to the muscles that bend the neck, being to be seen in the first table between* V, *and the number* 6.

X 1. Y. a 1. b 1. c 1. d 1. — The second X *making the greatest part of the nerve of the midriffe.* The third Y *goes to the muscle* Deltoides, *of which there is a propagation,* a, *which goes to the skin, that covers the muscles* Deltoides, *and* Biceps. The fourth b, *at the neck of the shoulder-blade is cleft into two branches;* one *of which,* c, *enters into the muscle* Deltoides, *at what part it growes out of the Collar-bone:* the other, d, *is implanted into the same, in the place where it grows out of the spine of the shoulder-blade.*

e 2. 6. 1. f 1. g 1. h 1. i. 1. l 2. 7. 1. m 1. 2. 8. 1. o 1. p 1. q 1. r 2. 9 1. t 1. u 1. x 2. 10, 11, 12 &c. to 19 inclusively 1. — The hinder branch, e.

The sixth pair *of the neck, whose* fore-branch f, *when it has propagated that circle* g, *which with the fourth and fifth pair,* S *and* X, *makes the nerve of the midriffe, is joined with the two following,* h, *and thus it makes up the nerve of the midriffe* i, *so that this arises out of three surcles* S, X, *and* g. *The* hinder branch l.

The seventh pair *of the neck, whose* fore-branch *is* m, *its* hinder one n.

The first pair *of the chest, whose* fore-branch o, *is united,* p, *with the seventh pair of the neck, and second of the chest, spreading a propagation* q, *through the upper side of the first rib. The* hinder branch r.

The second pair *of the chest, whose* fore-branch *sends forth a surcle* t, *running out through the first space betwixt the ribs, and sending surcles* u *to the muscles of the chest.* *The* hinder branch x.

The paires of nerves from the ninth to the twentieth, *which have the same series of propagations, and especially to the distances of the ribs. The* fore-branches *of these (fig.* 1.) *are scattered into the muscles seated on the forepart of the chest, and partly into their upper region, as* y, *partly into their lower* z, *which in women go also to the breasts; and then they send other surcles into the heads of the oblique descending muscles of the* abdomen a, *and into that which leads the arm from the breast* β, *another goes to the nipple of the breast* γ. The hinder branch δ.

y 1. x 1. α 1. β 1. γ 1. δ 1. ε 1. ζ 1. ηη 1. † θ 1. ι 1. κ 1. λ 1. μ 1. ν 1. ο 1. π 1. ρ 1. σ 1. τ 1. υ 1. φ 1. — The first nerve that goes to the arm, *which is scattered into the skin of the outside of the arm.*

The second nerve that goes to the arm, *whose two first propagations* ηη *goe to the two heads of the muscle* Biceps: *then it joins with the third nerve by a surcle* †. *Thirdly, it carries a propagation to the longer muscle that turns the palm of the hand downward* θ. *But about the bending of the cubit it is divided into two branches, an* outer ι, *and an* inner one κ. That ι *descending along the* radius *or wand, is inserted at the outside of the second joint of the thumb* λ. This κ *is by and by subdivided into an* outer μ, *and an* inner *branch* ν. This ν *is again cleft in the region of the cubit into an* outer *branch* ο, *and an* inner *one* π.

The third nerve entring the arm ρ, *before it attains to the arm, scatters a sprig betwixt the Pectoral muscle, and* Deltoides σ. *By and by having entred the arm, it distributes another,* τ, *into the second muscle that bends the cubit.* *After that descending it receives a branch from the second nerve* υ; *when it is past the bought of the arm, it is distributed into many*

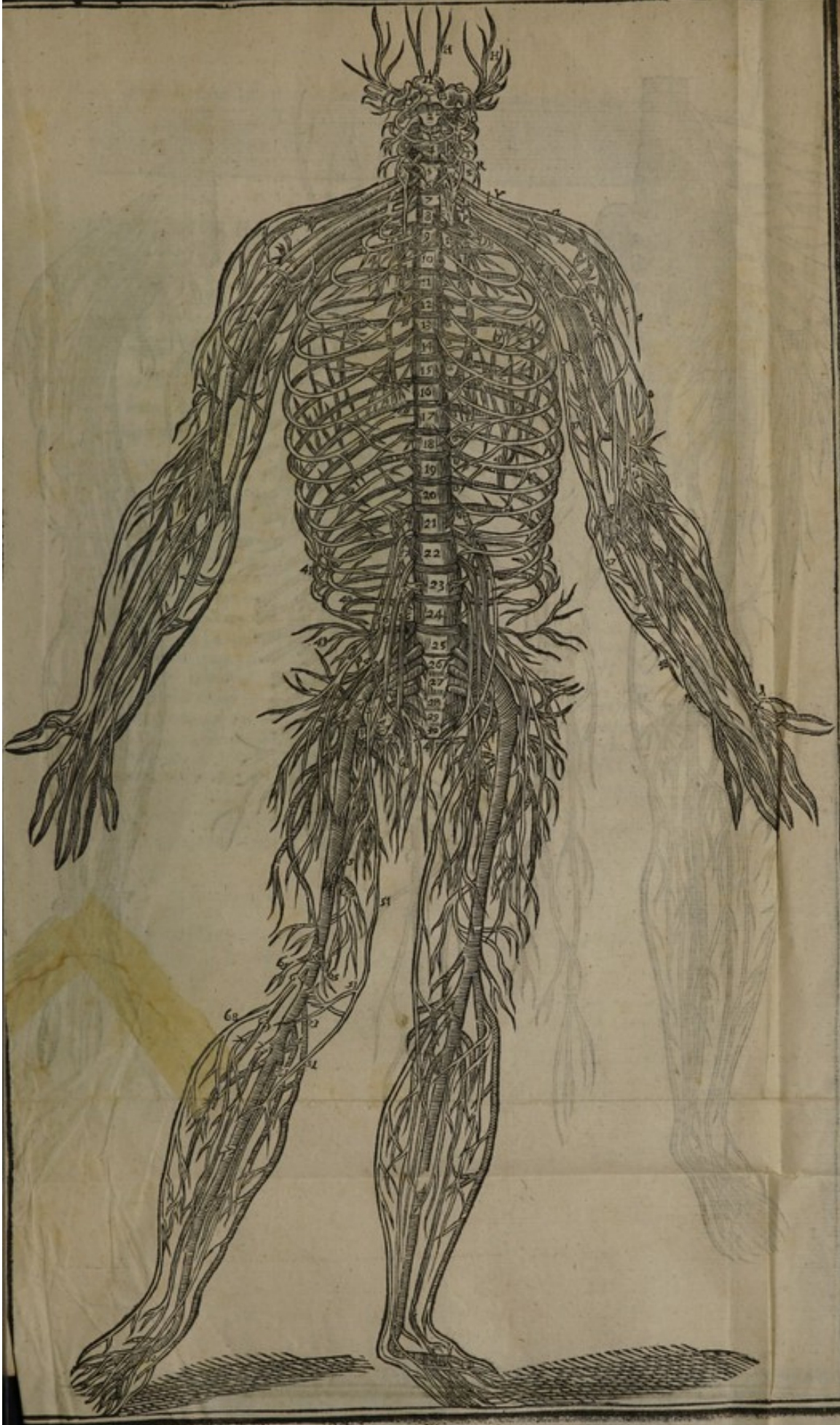
surcles

φ.1. surcles φ, at length about the palm of the
χ 1. hand it is divided into three branches χ.
Ψ 2. The fourth nerve entring the arm, which is the greatest of all them that goe to the arm, is not marked with any letters in the second table, but in the third only, lest the second should be too much blurred with Letters. This sodainly after it has entred the arm,
ω. reaches out small sprigs ω into the muscles, that extend the cubit, then another into
Γ. the inner skin, upwards and downward Γ, and
Δ. another into the lower part Δ, and another
Θ. Θ, which goes as far as to the wrist. After this near to the bought of the arm it is
Λ. divided into two branches, an outer one Λ, and an inner Π. That Λ about the transverse li-
Ξ. gament is again divided in two Ξ. This Π
Π. reaching all along the cubit sends forth more
Σ Φ. Ψ. propagations, the first Σ, the second Φ, the
Ω. third Ψ. Then another in its progresse Ω.
31. The remainder ends in the wrist 31.
32.1. The fifth that enters the arm, which about the inner protuberation of the arm, is dis-
33.34. seminated like to the third. Its first surcle 33,
35. its second 34, its third 35.
36.1. The sixth nerve of the arm, which goes
37. under the skin imparting many sprigs to it 37,
38. 37, 37. The end of it is 38.
20.21. The five pairs of the nerves of the
22, 23, loins: the first 20, the second 21, the third
24. 1. 22, the fourth 23, the fifth 24. A certain
39.1. branch arising from the first pair of the loins 20, and descending for the most part with the preparing artery to the testicle.
40.1. The course of the nerves through the muscles
41. 1. of the Abdomen; from which branches 41 goes to the muscle that leads the arm outward from the breast.
42. 2. The hinder branches of the nerves of the loins.
25, 26, The six pairs of the nerves of the great
27, 28, bone. Of these the first is 25, the second 26,
29, 30.1. the third 27, the fourth 28, the fifth 29, the sixth 30.
43.1. A Surcle reacht out from the fore-branch
44. 2. of the first nerve of the great bone to the inside of the hanch bone, and so to the muscles of the abdomen, that arise from that bone. Then a-
45. 1 nother spreading out from the hinder-branch to the muscles seated on the back of os Ilium, or the hanch-bone.
The termination of the spinall marrow passing on without a mate, and undivided.
46. 1. The first nerve entring the crus. This a-
47. rises where the third nerve of the loins meets
48.1. with the fourth 47. A branch of this 48 goes
49. 1. to the skin; but 49 it is entangled among the muscles, that are seated on the outside of the thigh.

50.1. The second crurall nerve, a notable pro-
51.1. pagation whereof 51 runs out in the same course with the vein Saphena to the end of
52.1. the foot, and there ends about 52. In the mean time it proffers another notable surcle
53.1. 53 to the foreside of the knee. But the remain-
54.1. der of the trunk 54 enters deep into the thigh,
55.1. and gives out a small branch 55, but without question the chief.
56.1. The third crurall nerve, whose propaga-
57.1. tion 57 goes to the muscles called Obtura-
58.1. tores, and another 58 to the skin. The re-
59.1. mainder 59 lies deep intangled in the muscles
60.1. whose chief propagation is 60, which is implanted into the second and third muscles, that bend the Leg.
61.1. The fourth, and that the thickest of all the nerves of the crus, whose first branch is
62.1. 62, which is inserted into the skin of the but-
63.1. tocks; another 63 is distributed into the heads of the muscles that arise from the ap-
94.1. pendix of the Hip: a third 64 is given to the fifth muscle, that bends the leg; and o-
65.1. thers 65 go into the outer calf-muscle; and that of the sole of the foot. But about the lower
66.1. heads of the thigh it is divided 66 into two branches, to wit, an outer one, 67, and an inner 72.
67.1. The outer branch, a propagation where-
68.1. of 68 is sent under the skin, that covers the outer part of the leg, and the outside of the foot.
69.1. But the branch itself 69 goes to the connexion of the lesser bone of the leg with the greater;
70.1. sending forth another surcle 70 to the forepart of the leg under the skin: the remainder of it
71.1. 71 reaches along the fibula or lesser bone of leg.
72.1. The inner branch a propagation
73.1. whereof, 73, goes through the inside of the leg toward the calf, and inside of the foot under the
74.1. skin: and then another 74 is scattered into the skin, especially that which covers the calf.
75.75.1. Another also 75, 75 goes into the fore-part of the leg through the ligament that joins the lesser bone of the leg to the greater, and afterward is spent on the upper side of the foot. The last
76.1. propagation 76 runs out betwixt the inner
77.1. and outer calf-muscles. The remainder of the trunk goes by the inner ankle to the lower part of the foot, distributing two surcles a peice to the lower part of all the toes.

The second and third figures of the second Table. These two figures do exhibit the nerves of the arm and leg in a larger form, then the first table does, so that all, which concerns those nerves, may be shew'n more accurately herein. But they have common characters, and the same explanation of the same serves for both.

THE



THE *Readers ordinary charity is desired in behalfe of the* PRESSE. *Such faults, as are more considerable in these three* TREATISES, *and from which the Translation might possibly have suffered, are here set downe. As for those petty slips, which concerne the misplacing of* commas, *or the like, they will be as easily observed by the Reader, as they have been committed by the Printer, and are amended even before they are taken notice of.*

PAG. 1. line 3. for (*common*) read *cava* or, ibid.l.34. for κυτικὰς read κυστικὰς, ib.l.39. read *of the stomach*, p.3.l.15. put out (*we have said above that,*) ib.l. 24. for (*divided*) read *distributed*, ib.l.55. read *propagation*.l.56. for (*or the right*) read *and &c.* ib.l.61. for (*Mesenterick branch*) read *Mesentery*, p.4.l.17. for (*turn*) *burne*, ib.l.35. read *very well cured*, ib.l.41. read *acute*, ib.l.45. for (*and abundance*) read *an abundance*, p.5.l.7. read *Leucophlegmatia*, p.6.l.4. read *about the liver*, ib.l.17. for (*a circuit*) *the circuit*, ib.l.19. read *of the midriffe*, p.8.l.12. read *to the sinus*, ib.l.47. for *cheek* read *jaw*, ib.l.58. for (*circle*) *furcle*, p.9.l.1. read *Cutaneus*, ib.l.4. read *hyoides*, ib.l.11. read *furcles*, as also p.10.l.35. p.11. l.9. read *Radieus*, pag.12.line32. for (*snivell*) read *a mucous matter* ib.l.67. for (*concocted*) *contorted*, pag. 16. line 12. for (*putting*) *pulling*, pag. 18.l.13. read *Radieus*, p.23.l.12. for (*cups*) *chops*, p.25.l.36. for (*change*) read *judication*, p.26.l.42. for (*of the lower*) *the lower*, p.28.l.20. read *the same symptomes*, p.31.l.35. put out *wit*, ib.l.39. (*for to*) read *the*, p.32.l.21. read *the stomach-arterie*, ib.l.37. for (*o*) read *of*, p.36.l.49. read *the outer angle*, p.38.l.34. for *returned* read *turned*, ib.l.39. read *many furcles*, p.41.l.1. read *slenderer*, p.43. l.40. *Splenicus*, ib.l.46. read *the first of the loines*, ib.l.49. *going out*, p.47.l.10. *gone forth through*, p.48.l.6. *in the inner*, ib.l.22. *into both*, p.49.l.4. for *circle* read *furcle*, ib.l.35. *hinder branches*.

FINIS.